M9A Sterilizer

Go To Table Of Contents

Used on units with Serial Number Prefixes "TFN"

Self-Contained Steam Sterilizer

Service and Parts Manual

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

SF-1573

Part No. 004-0082-00 Rev. E (6/01)

Go To Table Of Contents

TABLE OF CONTENTS

Section/Paragraph **Page**

IMPORTANT INSTRUCTIONS
General Safety Instructions ii
Safety Alert Symbols ii
Warranty Instructions ii

SECTION I GENERAL INFORMATION
1.1 Scope of Manual 1-1
1.2 How to Use Manual 1-1
1.3 Description of M9A Sterilizer 1-1
1.4 Standard Torque Specifications 1-4
1.5 Specifications 1-4
1.6 Parts Replacement Ordering 1-4
1.7 Special Tools 1-5

SECTION II TESTING AND TROUBLESHOOTING
2.1 Operational Test 2-1
2.2 Troubleshooting Procedures 2-3

SECTION III SCHEDULED MAINTENANCE
3.1 Scheduled Maintenance 3-1

SECTION IV MAINTENANCE/SERVICE INSTRUCTIONS
4.1 Introduction 4-1
4.2 Top Cover Removal / Installation 4-1
4.3 Right Hand Side Panel Removal / Installation 4-2
4.4 Left Hand Side Panel Removal / Installation 4-2
4.5 Back Panel Removal / Installation 4-3
4.6 Base Inspection Cover Removal / Installation 4-3
4.7 Bellows Assembly Removal / Installation 4-4
4.8 Temperature Sensor Assembly Removal / Installation 4-5
4.9 Pressure Vessel Water Level Sensor Removal / Installation 4-5
4.10 Vent Solenoid Removal / Installation 4-6
4.11 Fill Solenoid Removal / Installation 4-7
4.12 Control PC Board Removal / Installation 4-9
4.13 Door Switch Removal / Installation 4-11
4.14 Thermostat Removal / Installation 4-11
4.15 Wire Tray Rack and Tray Plate Removal / Installation 4-12
4.16 Heating Element and Gasket Removal / Installation 4-13

Section/Paragraph **Page**

4.17 Filter Removal / Installation 4-14
4.18 Door Gaskets Removal / Installation 4-14
4.19 Display PC Board Removal / Installation ... 4-15
4.20 Condensing Tank Assembly Removal / Installation 4-15
4.21 Pressure Relief Valve Removal / Installation 4-16
4.22 Pressure / Temperature Potentiometers Adjustments 4-17
4.23 Display PC Board Lamp / Display / Button Check 4-20
4.24 Pressure Relief Valve Check 4-21
4.25 Dry Cycle Dip Switches Adjustment 4-21
4.26 HEPA Filter Removal / Installation 4-22
4.27 Air Compressor Removal / Installation 4-23
4.28 Dry Air Inlet Solenoid Valve Removal / Installation 4-23
4.29 Dry Air Outlet Solenoid Valve Removal / Installation 4-25

SECTION V SCHEMATICS AND DIAGRAMS
5.1 Wiring Diagram 5-1
5.2 Flow Diagram 5-2
5.3 Pressure / Temperature Chart 5-7

SECTION VI PARTS LIST
6.1 Introduction 6-1
6.2 Description of Columns 6-1
6.3 Torque Specifications and Important Assembly Notes 6-1
Pictorial Index 6-2
Main Enclosure Components 6-3
Plumbing and Sensor Components ..... 6-4.*
Pressure Vessel Components 6-5
Manifold Components ..... 6-6.*
Dry Solenoid Manifold Assembly 6-7
Electrical Components 6-8
Control PC Board 6-9
Labels and Decals ..... 6-10.*
Printer Components 6-11
Racks, Trays, and Cleaner 6-12
Packaging 6-13

COMMENTS 7-1
FAX ORDERING FORM 7-2

(*) Indicates that there has been a serial number break for the illustration and that there are additional point page(s) following the original page.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

IMPORTANT INSTRUCTIONS

General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this sterilizer is maintained with the safety of the patient and staff in mind. To assure that services and repairs are completed safely and correctly, proceed as follows:

(1) Read this entire manual before performing any services or repairs on this sterilizer.

(2) Be sure you understand the instructions contained in this manual before attempting to service or repair this sterilizer.

Safety Alert Symbols

Throughout this manual are safety alert symbols that call attention to particular procedures. These items are used as follows:

DANGER

A DANGER is used for an imminently hazardous operating procedure, practice, or condition which, if not correctly followed, will result in loss of life or serious personal injury.

WARNING

A WARNING is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in loss of life or serious personal injury.

CAUTION

A CAUTION is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT

An EQUIPMENT ALERT is used for an imminently or potentially hazardous operating procedure, practice, or condition which, if not correctly followed, will or could result in serious, moderate, or minor damage to unit.

NOTE

A NOTE is used to amplify an operating procedure, practice or condition.

Warranty Instructions

Refer to the Midmark “Limited Warranty” printed in the Installation and Operation Manual for warranty information. Failure to follow the guidelines listed below will void the warranty and/or render the M9A sterilizer unsafe for operation.

- In the event of a malfunction, do not attempt to operate the sterilizer until necessary repairs have been made.
- Do not attempt to disassemble sterilizer, replace malfunctioning or damaged components, or perform adjustments unless you are one of Midmark’s authorized service technicians.
- Do not substitute parts of another manufacturer when replacing inoperative or damaged components. Use only Midmark replacement parts.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

1.1 Scope of Manual

This manual contains detailed troubleshooting, scheduled maintenance, maintenance, and service instructions for the M9A Sterilizers. This manual is intended to be used by Midmark's authorized service technicians.

1.2 How to Use Manual

A. Manual Use When Performing Scheduled Maintenance.

(1) Perform inspections and services listed in Scheduled Maintenance Chart (Refer to para 3.1).

(2) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with Maintenance/Service Instructions (Refer to para 4.1).

B. Manual Use When Sterilizer Is Malfunctioning And Cause Is Unknown.

(1) Perform an operational test on sterilizer (Refer to para 2.1).

(2) Perform troubleshooting procedures listed in Troubleshooting Guide (Refer to para 2.2).

(3) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with Maintenance/Service Instructions (Refer to para 4.1).

C. Manual Use When Damaged Component Is Known.

(1) Replace or adjust component in accordance with Maintenance/Service Instructions (Refer to para 4.1).

1.3 Description Of M9A Sterilizer

A. General Description (See Figure 1-1).

The M9A Sterilizers are designed to sterilize medical, dental, and surgical instruments. The major components of the sterilizer consist of a pressure vessel, air compressor assembly, HEPA filter assembly, condensing tank assembly, heating element, temperature sensor assembly, pressure vessel water level sensor, thermostat, door switch, control PC board, fill solenoid, vent solenoid, dry air inlet solenoid valve, dry air outlet solenoid valve, bellows assembly, display PC board, and a pressure relief valve.

B. Theory of Operation (See Figures 5-1 and 5-2).

Power Up

Power is supplied to the control PC board when the sterilizer is plugged in. At this time, the control PC board will flash the error lamp and display "E 001". This is normal and occurs when the sterilizer is first plugged in or if a power outage has occurred. The control PC board also checks settings on board for English / Metric units setting, 115 VAC / 230 VAC setting, and dry mode duty cycle setting.

Operation

When the ON/STANDBY switch is pressed, the error lamp extinguishes and the program switches are enabled. The program lamps flash and the ON/STANDBY indicator lamp illuminates.

The operator determines the desired cycle and selects the cycle by pressing either: UNWRAPPED, POUCHES, LIQUIDS, or PACKS button. Upon selecting the desired cycle, the control PC board sets the specific time and temperature parameters for that cycle into memory. These settings are alternately displayed on the TIME/TEMP display. Note: The control PC board will continue to use the same parameters on subsequent cycles until a new type of cycle is selected.

The operator presses the START button which signals the control PC board to initiate the cycle.

New Cycle Start

The control PC board starts a total elapsed time register. Also, the control PC board continuously monitors for an open door condition from the time the START button is pressed until the start of the drying cycle. It does this by monitoring the door switch for continuity. If no continuity is detected after a cycle has been started, the control PC board will stop the cycle and illuminate the DOOR AJAR indicator. The DOOR AJAR indicator will continue to flash until continuity is sensed or until

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

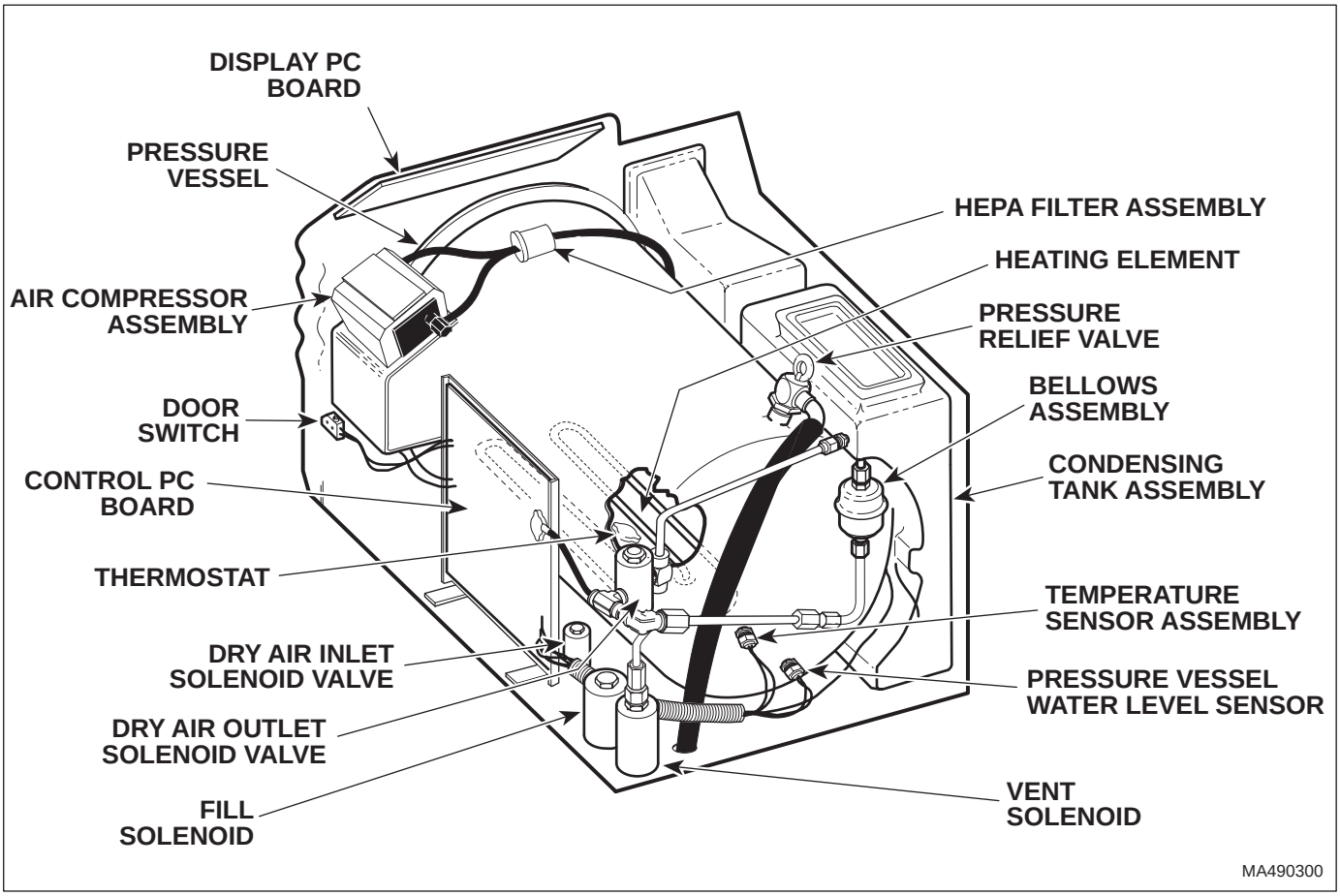


Figure 1-1. Major Components

the STOP or ON/STANDBY button is pressed. Or, if the door is closed and continuity is sensed, the control PC board continues the cycle.

The control PC board monitors the pressure vessel water level sensor to determine if a low water condition in the condensing tank exists. If the pressure vessel water level sensor does not sense water within 5 minutes of starting the FILLING portion of the cycle, the control PC board stops the cycle, illuminates the WATER LOW indicator and starts sounding a beeper signal which sounds every two second (until either the STOP or ON/STANDBY button is pressed).

The control PC board also checks the chamber pressure before energizing the fill solenoid (too high of pressure in chamber will resist water entering the chamber during fill portion of cycle). If the chamber pressure is above 2.2 psi (15 kPa), the control PC board removes power from the closed N.O. vent valve, opening the valve, until the pressure falls below 15 kPa (2.2 psi).

Filling

The control PC board illuminates the FILLING indicator and energizes the fill solenoid which allows water to flow from the condensing tank to the pressure vessel. The control PC board controls the water level in the pressure vessel by monitoring the pressure vessel water level sensor for continuity. When water completes the ground circuit between the pressure vessel water level sensor and the chassis, the control PC board de-energizes the fill solenoid.

Sterilizing

The control PC board extinguishes the FILLING indicator lamp and illuminates the STERILIZING indicator lamp. During this portion of the cycle, temperature and pressure in the pressure vessel are continuously monitored until the drying portion of the cycle begins. A precision integrated circuit temperature sensor potted inside a brass thermowell is used to monitor the temperature inside the pressure vessel. A PC board mounted piezoresistive pressure sensor, connected by plumbing to the pressure vessel, is used to monitor the pressure in the pressure vessel.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

The control PC board energizes the heating element to begin heating the water in the pressure vessel. The temperature in the pressure vessel is displayed on the display PC board. As the water begins to boil, air is bled off through the bellows assembly into the condensing tank. The pressure in the pressure vessel is not displayed until the temperature in the pressure vessel reaches 98°C (208°F). When the bellows assembly senses pure steam flowing through it [which is approximately 102°C (215°F)], the valve in the bellows assembly closes, allowing the pressure in the pressure vessel to build. When the temperature corresponding to the cycle selected is reached, the control PC board de-energizes the heating element and begins to count down the remaining time left in the cycle. The remaining time is now displayed on the display PC board instead of the temperature. During this portion of the cycle, the control PC board regulates the pressure vessel temperature/ pressure by energizing and de-energizing the heating element as necessary. The programmed temperatures are the minimum values, and the temperature during the cycle is regulated approximately 1.1 to 1.6°C (2 to 3°F) above those minimum values.

During the sterilizing portion of the cycle, the control PC board continuously monitors the pressure sensor, temperature sensor, door switch, STOP button, and the ON/STANDBY button. If the pressure exceeds 250 kPa (36.3 psi), the pressure drops more than 20 kPa (2.9 psi) below the sterilization pressure, the temperature exceeds 138.3°C (281°F), or the status of the door switch, STOP button, or ON/STANDBY button changes, the control PC board de-energizes the heating element and initiates an error sequence.

When an error sequence is initiated, the control PC board de-energizes the vent solenoid (opening the valve), flashes the ERROR indicator, sounds a beeper signal, and displays the error code, corresponding to the cause of the error, on the TEMP/TIME display. When the pressure in the pressure vessel drops to 6 kPa (0.9 psi), the control PC board delays 35 seconds. The control PC board then stops sounding the beeper signal. The ERROR indicator lamp continues to flash and the error code continues to be displayed until the STOP or ON/STANDBY button is pressed.

Venting

When the cycle's set time has elapsed, the control PC board de-energizes the heating element and de-energizes the vent solenoid, unless the liquids cycle was selected. If the liquids cycle was selected, the control PC board de-energizes the heating element, but does not de-energize the vent solenoid until the temperature in the pressure vessel drops to 106°C (223°F).

The control PC board monitors the pressure in the pressure vessel until it drops to 6 kPa (0.9 psi). At that time, the control PC board goes into a 35 second delay. At the end of the delay, the control PC board sounds a series of five beeper signals, energizes the vent solenoid (closing it), and then starts the dry mode.

Drying

The control PC board illuminates the DRYING indicator and extinguishes the STERILIZING indicator. The control PC board begins a countdown of 30 minutes and displays this time on the TEMP/TIME display. The control PC board energizes the air compressor, dry air inlet solenoid valve, and dry air outlet solenoid valve. The compressor forces air thru the HEPA filter (to clean and dry the air) and dry air inlet solenoid valve and then into the pressure vessel. The air then flows back out of the pressure vessel and thru the dry air outlet solenoid valve to the condensing tank. Also, the control PC board energizes the heating element for 45 seconds, delays two minutes, energizes the heating element for 30 seconds, delays two minutes, energizes the heating coil for a predetermined duration (the duration can be set on the dip switch assembly for different time intervals), and then delays for two more minutes. The control PC board continues to energize the heating element for xx seconds followed by a two minute delay for the rest of the drying portion of the cycle. There is a dip switch assembly on the control PC boards which contains two switches for "dry cycle element duration". There are four possible combinations for these two switches, which results in setting the heating element duration during the drying cycle; they are element duration setting #1, setting #2, setting #3, and setting #4. Setting #1 is shortest element duration (coolest), setting #2 is longer, setting #3 is longer yet, and setting #4 is the longest element duration (hottest). This function allows adjustment of dry cycle element duration on units which are overheating during drying cycle. The unit comes factory set at element duration setting #3. After 30 minutes have elapsed, the control PC board illuminates the COMPLETE indicator, extinguishes the DRYING indicator, and sounds the beeper signal seven times. If the liquids cycle was selected, the DRYING indicator does not illuminate, the heating element does not energize, and the COMPLETE indicator illuminates. If the STOP button is pressed during the drying portion of the cycle, a new cycle can be initiated.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

Safety Controls

Several safety checks are present to prevent the pressure vessel from exceeding safe pressure and temperature limits. The control PC board limits the pressure and temperature from exceeding 250 kPa (36.3 psi) and 138.3°C (281°F) respectively, a pressure relief valve prevents the pressure from exceeding 275.7 kPa (40 psi), and a bi-metallic thermostat shuts off power to the control PC board if the pressure vessel temperature exceeds 146°C (295°F).

1.4 Standard Torque Specifications

The following standard torque specifications in Table 1-1 apply to the hardware used on the unit unless otherwise listed elsewhere in the service procedures or parts illustrations:

Table 1-1. Torque Specifications

Hardware Size	Torque Values
#6	11 to 21 inch / lbs. (1.2 to 2.3 N•M)
#8	20 to 30 inch / lbs. (2.2 to 3.3 N•M)
#10	32 to 42 inch / lbs. (3.6 to 4.8 N•M)
1/4 inch	75 to 85 inch / lbs. (8.5 to 9.6 N•M)
5/16 inch	18 to 22 ft. / lbs. (24.4 to 29.8 N•M)
3/8 inch	31 to 35 ft. / lbs. (42.0 to 47.5 N•M)
1/2 inch	50 to 60 ft. / lbs. (67.8 to 81.4 N•M)

1.5 Specifications (See Figure 1-2)

Factual data for the sterilizer is provided in Table 1-2. Also see Figure 1-2 for specifications.

Table 1-2. Specifications

Description	Data
Dimensions (overall):	
Length (depth)	48.3 cm (19 in)
Width	38.1 cm (15 in)
Height (w/o printer)	41.8 cm (16-7/16 in)
Height (w/ printer)	42.9 cm (16-7/8 in)
Shipping Carton	56 cm x 45 cm x 46 cm (22 in x 17.75 in x 18 in)
Weight:	
Reservoir Empty	34.1 kg (75 lb)
Reservoir Full	37.2 kg (82 lb)
With Shipping Carton	37.7 kg (83 lb)
Water Reservoir Capacity	3.3 Liters to full mark (Approx. 7/8 gallon)
Electrical Requirements:	
230 VAC Unit	220 - 240 VAC 50 HZ, 7 AMPS, single phase
Power Consumption:	
230 VAC Unit	1500 WATTS, 7 AMPS @ 240 VAC
Recommended Circuit:	A separate (dedicated) circuit is recommended for this sterilizer. The sterilizer *should not* be connected to an electrical circuit with other appliances or equipment unless the circuit is rated for the additional load.
Chamber Pressure:	
Operating	196 - 223.4 kPa (28.4 - 32.4 psi)
Minimum Before Door Is Released	6 kPa (0.9 psi)
Maximum Before Safety Valve Opens	275.7 kPa (40 psi)
Chamber Temperature (Operating):	
Unwrapped Cycle	134.4°C (274°F)
Pouches Cycle	134.4°C (274°F)
Liquids Cycle	125°C (257°F)
Packs Cycle	125°C (257°F)
Maximum Before Thermostat Energizes	146°C (295°F)

1.6 Parts Replacement Ordering

If a part replacement is required, order the part directly from the factory as follows:

(1) Refer to Figure 1-3 to determine the location of the model number and serial number of the sterilizer and record this data. There are different letter prefixes which proceed the serial number, depending on the configuration of the unit. These prefixes are very important and are needed to order the proper parts.

(2) Refer to the Parts List to determine the item numbers of the parts, part numbers of the parts, descriptions of the parts, and quantities of parts needed and record this data (Refer to para 6.1).

NOTE

Ask the Purchasing Department of the company that owns the sterilizer for this information. Otherwise, this information may be obtained from the dealer that sold the sterilizer.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

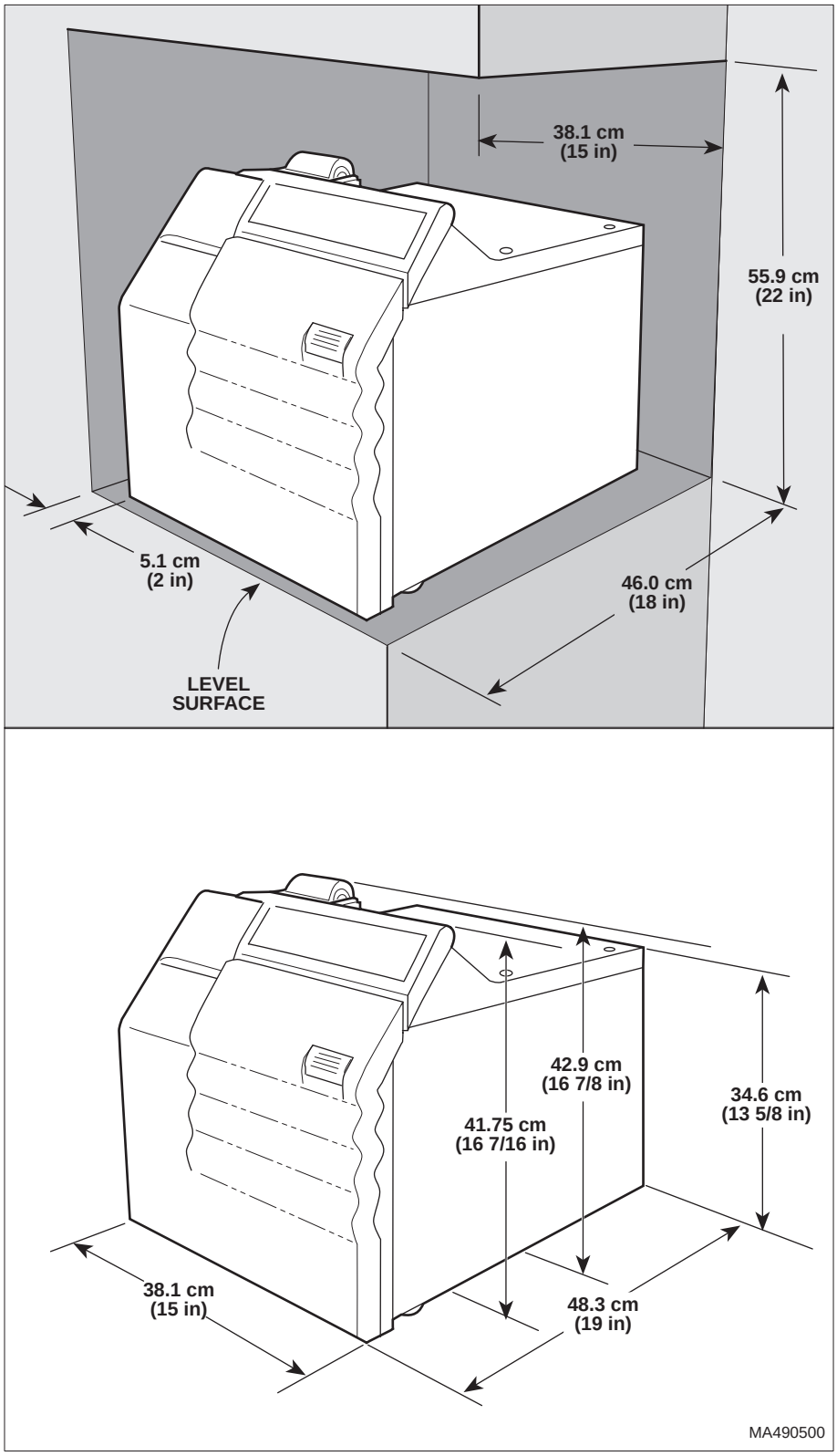


Figure 1-2. Location Specifications

SECTION I
GENERAL INFORMATION

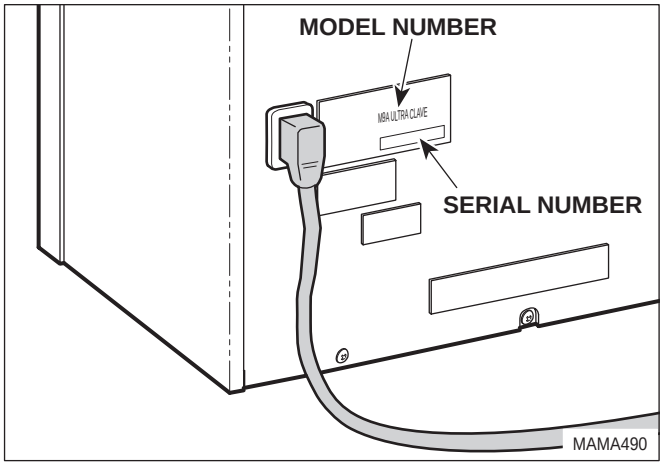


Figure 1-3. Model Number / Serial Number Location

(3) Determine the installation date of the sterilizer and record this data.

(4) Call Midmark with the recorded information and ask for the Medical Services Department. See back cover of this manual for the phone number or use the Fax Order Form (See page 7-2 for Fax Order Form).

1.7 Special Tools

Table 1-3 lists all the special tools needed to repair the sterilizer, describes how to obtain the special tools, and describes the purpose of each special tool.

Table 1-3. Special Tool List

Description of Special Tool	Manufacturer's Name / Address / Phone	Manufacturer's Part Number	Purpose of Special Tool
Digital Multimeter (must be capable of displaying 3 digits)	Commercially Available	Any Type	Used to check probes, switches, and connections for proper function by performing continuity checks.
Pressure Gauge Test Harness	Midmark Corp. 60 Vista Drive Versailles, Ohio 45380 (937 526-3662)	002-0372-00	Used to check the pressure in the pressure vessel during a cycle to diagnose malfunctions and / or adjust the pressure range potentiometer to a correct setting.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

2.1 Operational Test

In order to effectively diagnose the malfunction of the M9A sterilizer, it is necessary to perform an operational test as follows:

WARNING
Refer to the operator manual for complete instructions on operating the sterilizer. Failure to do so could result in severe personal injury.

(1) Place sterilizer on a level surface.

(2) Remove right hand side panel (Refer to para 4.3).

(3) Plug sterilizer into a properly grounded receptacle, capable of supplying correct and adequate power to operate this sterilizer.

(4) Open sterilizer door.

(5) Press and hold down STOP and POUCHES buttons simultaneously while connecting power cord to sterilizer (See Figure 2-1). Release STOP and POUCHES buttons.

(6) Observe display PC board lamps. In a left to right sequence, each lamp on display PC board should individually illuminate and then extinguish. Also, displays will show number "8" in the four digits of TEMP (°C) / TIME (MIN: SECONDS) display and three digits of PRESSURE (KPA) display.

(7) Press and release UNWRAPPED, POUCHES, LIQUIDS, PACKS, START, STOP, and ON/STANDBY buttons one at a time and in this order.

(8) Observe lamps that correspond with each button. When each button is pressed, its corresponding lamp should illuminate and stay illuminated.

(9) Close sterilizer door.

(10) Observe. The DOOR AJAR lamp should illuminate, indicating the door switch is operating correctly.

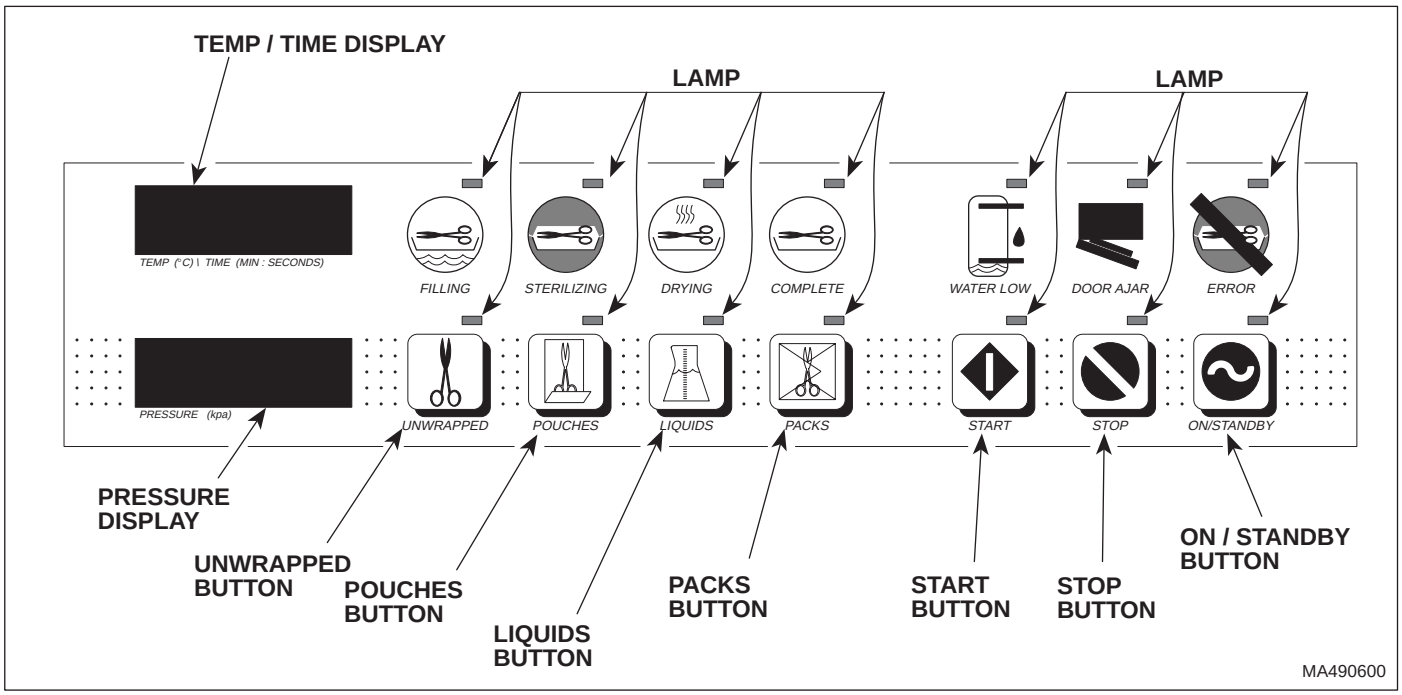


Figure 2-1. Display PC Board Lamp / Display / Button Check

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

(11) Open sterilizer door.

(12) Using a metal object or jumper wire, short pressure vessel water level sensor to pressure vessel itself (See Figure 2-2).

(13) Observe. The ERROR lamp (See Figure 2-1) should illuminate indicating that pressure vessel water level sensor is operating correctly.

(14) Observe. The PRESSURE (KPA) display should display pressure that control PC board is reading, and TEMP (°C) / TIME (MIN: SECONDS) display should display temperature that control PC board is reading.

(15) Disconnect power cord from sterilizer.

(16) Connect Pressure Gauge Test Harness to sterilizer (See Figure 2-3) (Refer to Table 1-2 for special tool).

(17) Drain water from condensing tank.

(18) Close sterilizer door.

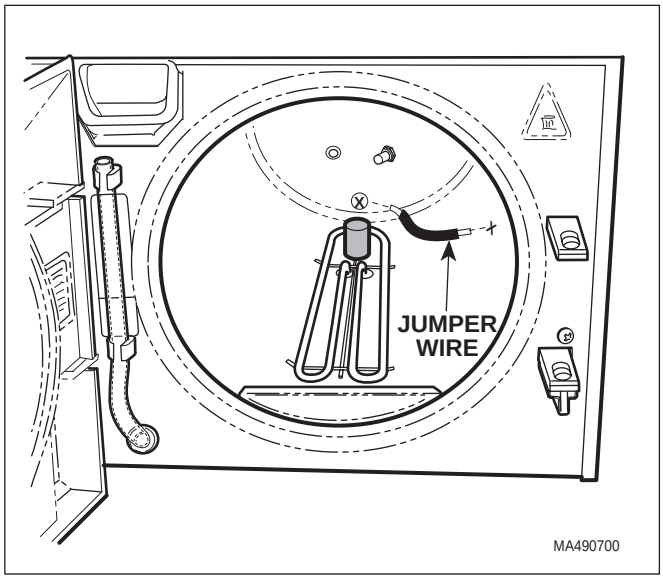
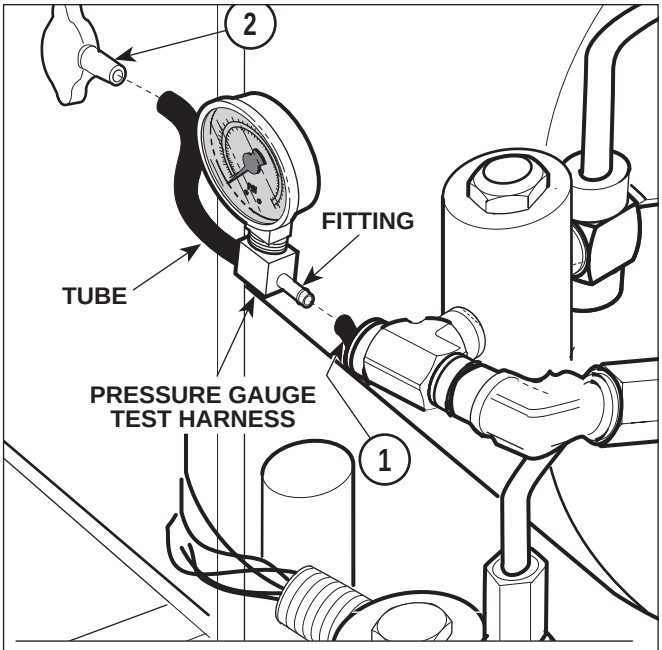


Figure 2-2. Pressure Vessel Water Level Sensor Test



To connect Pressure Gauge Test Harness to sterilizer:

1. **Disconnect tube (1) from pressure sensor (2).**
2. **Connect tube of Pressure Gauge Test Harness to pressure sensor (2).**
3. **Connect tube (1) to fitting of Pressure Gauge Test Harness.**

To disconnect Pressure Gauge Test Harness from sterilizer:

1. **Disconnect tube (1) from fitting of Pressure Gauge Test Harness.**
2. **Disconnect tube of Pressure Gauge Test Harness from pressure sensor (2).**
3. **Connect tube (1) to pressure sensor (2).**

MA490800

Figure 2-3. Connecting / Disconnecting Pressure Gauge Test Harness

WARNING

The following steps require sterilizer to be plugged in to power while operational test is being performed. Do not touch any components inside of sterilizer. Failure to comply with these instructions could result in an electrical shock, which could result in severe personal injury or death.

(19) Connect power cord to the sterilizer.

(20) Press ON/STANDBY button, followed by UNWRAPPED button, followed by START button (See Figure 2-1).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(21) Observe. The FILLING lamp should illuminate. After approximately 5 minutes, FILLING lamp should extinguish, WATER LOW lamp should illuminate, and a beeper signal should sound.

(22) Press STOP button followed by ON/STANDBY button.

(23) Fill condensing tank with distilled water.

(24) Open the sterilizer door.

NOTE
Ensure that sterilizer door is open during following step.

(25) Press ON/STANDBY button, followed by UNWRAPPED button, followed by START button (See Figure 2-1).

(26) Observe. The DOOR AJAR lamp should begin to flash, and the beeper signal should start to sound.

(27) Close sterilizer door.

(28) Observe. The DOOR AJAR lamp should extinguish and beeper sound should stop. The FILLING lamp should illuminate. After 30 -90 seconds, FILLING lamp should extinguish and STERILIZING lamp should illuminate. Should begin to hear water boiling in pressure vessel and steam and air releasing through bellows assembly.

(29) Observe. At 96°C (205°F), should begin to hear bellows assembly close. At approximately 102°C (215°F), should hear bellows assembly close completely (hissing sound stops). The PRESSURE (KPA) display should begin to display pressure.

(30) When the “heat up” portion of the cycle is complete and the elapsed time is being counted down on the display PC board, compare the pressure displayed on the PRESSURE (PSI) display to the pressure displayed on the Pressure Gauge Test Harness. The two pressures should agree with each other within ± 3.5 kPa (0.5 PSI).

(31) Observe. When the time elapsed on the TEMP (°C)/TIME (MIN : SECONDS) display reaches zero, the vent solenoid should energize. Should hear steam and air venting into the condensing coil. The TEMP (°C)/TIME (MIN : SECONDS) display should show the temperature in the pressure vessel decreasing and the PRESSURE (KPA) display should show the pressure in the pressure vessel decreasing. When the pressure drops to approximately 6 kPa (0.9 psi) on the PRESSURE (KPA) display, there should be a 35 second pause followed by temperature display going blank; then drying portion of cycle should begin.

(32) Observe. The air compressor should begin to run. The air compressor should not sound like it is straining, indicating there is blockage in line.

(33) Stop the sterilizer from proceeding into the drying portion of the cycle by pressing the STOP button.

(34) Set the multimeter to read at least 5 VDC. Connect the red lead of the multimeter to Test Point (A, Figure 4-26) and the black lead of the multimeter to Test Point (B).

(35) Observe. The multimeter should read 2.550 VDC ±0.001 VDC.

(36) If sterilizer does not operate correctly as described in steps 1 thru 35, replace the malfunctioning component(s) or perform the adjustment(s) that are necessary to correct the problem. If necessary, refer to Table 2-1, Troubleshooting Guide, to determine the exact cause of the malfunction.

(37) Disconnect power cord from sterilizer.

(38) Disconnect Pressure Gauge Test Harness from sterilizer (See Figure 2-2).

(39) Install right hand side panel (Refer to para 4.3).

2.2 Troubleshooting Procedures (see next page)

Table 2-1 is a troubleshooting guide which is used to determine the cause of the malfunction.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

Table 2-1. Troubleshooting Guide

Problem	Symptom	Probable Cause	Check	Correction
Error code is initiated during cycle.	Error code 1 is initiated during cycle (power interruption to control PC board).	Control PC board connections loose.	Check all wiring connections.	Clean any dirty connections. Tighten any loose connections. Replace damaged connections.
		Power outage.	_	Initiate new cycle after allowing sterilizer to cool.
		Thermostat activated because fill solenoid is leaking, allowing chamber to overheat.	Check for continuous flow of water escaping into reservoir during cycle.	Clean / replace fill solenoid. Refer to para 4.11.
		Thermostat activated because vent solenoid is leaking, allowing chamber to overheat.	Check for continuous flow of water escaping from condensing coil during cycle.	Clean / replace vent solenoid. Refer to para 4.10.
		Thermostat activated because bellows assembly is leaking, allowing chamber to overheat.	Check for continuous flow of steam escaping into reservoir during cycle.	Replace bellows assembly. Refer to para 4.7.
		Thermostat activated because dry air inlet solenoid valve is leaking, allowing chamber to overheat.	Check for water in dry air inlet line (to air compressor).	Clean / replace dry air inlet solenoid valve. Refer to para 4.28.
		Thermostat activated because dry air outlet solenoid valve is leaking, allowing chamber to overheat.	Check for continuous flow of water escaping from condensing coil during cycle.	Clean / replace dry air outlet solenoid valve. Refer to para 4.29.
		Thermostat activated because pressure relief valve is not seated properly or is mal-functioning, allowing chamber to overheat.	Check for water escaping from the pressure relief valve exhaust tube under the sterilizer.	If pressure relief valve will not reseat properly, replace pressure relief valve. Refer to para 4.21.
		Thermostat activated because door gaskets are leaking during cycle, allowing chamber to overheat.	Remove gaskets and check for dirt on gaskets, deterioration of gaskets, or voids in gaskets.	Clean / replace door gaskets. Refer to para 4.18.
		Pressure vessel water level sensor wet from previous cycle, causing fill cycle to be skipped.	Check pressure vessel water level sensor area for moisture.	Allow pressure vessel water level sensor to air dry or remove and hand dry. Refer to para 4.9.
		Pressure vessel water level sensor is malfunctioning or dirty.	Perform continuity check on pressure vessel water level sensor.	Clean / replace pressure vessel water level sensor Refer to para 4.9.
		Thermostat activated during drying cycle due to high facility input voltage or high resistance in heating element.	Check facility input voltage. Voltage should not be over 250 VAC.	Adjust the dry cycle time dip switches. Refer to para 4.25.
			Check resistance of heating element: 240 V - 40.46 to 44.71 ohms	If resistance is out of limits, replace heating element. Refer to para 4.16.
		Thermostat malfunctioning - stuck open.	Perform continuity check on thermostat (is N.C). - opens when heated past limit.	Replace thermostat. Refer to para 4.14.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Error code is initiated during cycle - Continued	Error code 2 is initiated during cycle (STOP button is pushed during cycle).	Operator initiated.	–	Restart cycle after beeper signal stops.
	Error code 3 is initiated during cycle (ON/STANDBY button is pushed during cycle).	Operator initiated.	–	Restart cycle after beeper signal stops.
	Error code 4 is initiated during cycle (door is ajar).	Door latch not closed completely.	Check for free movement of the door latch.	Clean / lubricate door latch and door pins.
		Door switch connection loose.	Check door switch connection.	Clean any dirty connections, tighten any loose connections, and replace damaged connections.
		Door switch malfunctioning.	Perform continuity check on door switch.	Replace door switch. Refer to para 4.13.
		Door switch spring movement hampered.	Check for free door switch spring movement.	Clean / replace door switch spring.
	Error Code 5 is initiated during cycle [pressure during cycle exceeds 250 kPa (36.3 psi)].	Sterilizer overloaded.	Check that pressure vessel is not overloaded with heavy linen packs.	Instruct operator to reduce load size.
		Pressure zero and pressure range potentiometers out of adjustment.	Check calibration of potentiometers with Pressure Gauge Test Harness.	Adjust pressure zero and pressure range potentiometers. Refer to para 4.22.
		Temperature potentiometer out of calibration.	Check calibration of temperature potentiometer.	Adjust temperature potentiometer. Refer to para 4.22.
		Bellows assembly malfunctioning.	Run cycle and check that bellows assembly closes at 95 - 99 degrees C (203-210 degrees F).	Replace bellows assembly. Refer to para 4.7.
		Temperature sensor assembly malfunctioning.	Replace suspect temperature sensor assembly with known working temperature sensor assembly.	Replace temperature sensor assembly. Refer to para 4.8.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Error code is initiated during cycle - Continued.	Error code 6 is initiated during cycle [temperature during cycle exceeds 138.3 degrees C (281 degrees F)].	Sterilizer overloaded.	Check that pressure vessel is not overloaded with heavy linen packs.	Instruct operator to reduce load size.
		Temperature potentiometer out of calibration.	Check calibration of temperature potentiometer.	Adjust temperature potentiometer. Refer to para 4.22.
		Pressure zero and pressure range potentiometers out of adjustment.	Check calibration of potentiometers with Pressure Gauge Test Harness.	Adjust pressure zero and pressure range potentiometers. Refer to para 4.22.
		Temperature sensor assembly malfunctioning.	Replace suspect temperature sensor assembly with known working temperature sensor assembly.	Replace temperature sensor assembly. Refer to para 4.8.
		Components are leaking allowing water or steam to escape. See components leaking under Error Code 7 below.		
	Error code 7 is initiated during cycle [pressure during cycle falls below 24.5 psi (169 kPa)].	Fill solenoid valve is leaking.	Check for high water level in pressure vessel during cycle.	Clean / replace fill solenoid. Refer to para 4.11.
		Vent solenoid is leaking.	Check for water leakage from condensing coil during cycle.	Clean / replace vent solenoid Refer to para 4.10.
		Bellows assembly is malfunctioning.	Look for continuous flow of steam escaping during cycle (into condensing tank).	Replace bellows assembly. Refer to para 4.7.
		Dry air inlet solenoid valve is leaking.	Check for water in dry air inlet line.	Clean / replace dry air inlet solenoid valve. Refer to para 4.28.
		Dry air outlet solenoid valve is leaking.	Check for water leakage from condensing coil during cycle.	Clean / replace dry air outlet solenoid valve. Refer to para 4.29.
		Pressure zero and pressure range potentiometers out of adjustment.	Check calibration of potentiometers with Pressure Gauge Test Harness.	Adjust pressure zero and pressure range potentiometers. Refer to para 4.22.
		Pressure relief valve is not seated properly or is mal-functioning, allowing chamber to overheat.	Check for water escaping from pressure relief valve exhaust tube under the sterilizer.	If pressure relief valve will not reseat properly, replace pressure relief valve. Refer to para 4.21.
		Door gaskets leaking.	Remove gaskets and check for dirt on gaskets, deterioration of gaskets, or voids in gaskets.	Clean / replace door gaskets. Refer to para 4.18.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Error code is initiated during cycle - Continued.	Error code 9 is initiated during cycle (pressure buildup in the pressure vessel during drying cycle).	The dry air outlet solenoid valve is malfunctioning.	Perform continuity check on solenoid coil or replace solenoid valve with known working solenoid valve.	Adjust, clean, and/or lubricate door components.
		Pressure zero potentiometer is out of adjustment.	Perform pressure zero potentiometer adjustment.	Adjust pressure zero potentiometer. Refer to para 4.22.
	Error code 10 is initiated during cycle (watchdog timer reset error).	Control PC board has had a software / hardware failure.	Unplug power cord from sterilizer. Wait 5 seconds and then replug power cord into sterilizer.	If error code shows up continually, replace control PC board. Refer to para 4.12.
	Error code 11 is initiated during cycle (software interrupt error).	Control PC board has had a software / hardware malfunction.	Unplug power cord from sterilizer. Wait 5 seconds and then replug power cord into sterilizer.	If error code shows up continually, replace control PC board. Refer to para 4.12.
	Error code 12 is initiated during cycle (ram test error).	Control PC board has failed self-diagnostic check when powered up due to a software / hardware malfunction.	Unplug power cord from sterilizer. Wait 5 seconds and then replug power cord into sterilizer.	If error code shows up continually, replace control PC board. Refer to para 4.12.
	Error code 15 is initiated during cycle (STOP or ON/STANDBY button is pressed during cycle)	STOP or ON/STANDBY button was pressed by operator during dry ing portion of cycle.	–	Inform operator of the need to let cycle finish.
WATER LOW indicator illuminates.	WATER LOW indicator illuminates after a cycle is started.	Pressure vessel water level sensor malfunctioning or dirty.	Perform continuity check on pressure vessel water level sensor.	Clean / replace pressure vessel water level sensor. Refer to para 4.9.
		Fill solenoid valve is malfunctioning or plugged.	Check to see if water is entering the chamber during fill portion of cycle	If not, clean / replace fill solenoid valve. Refer to para 4.11.
		Filter / tubing plugged.	Remove filter and tubing and inspect.	Clean / replace filter and/or tubing. Refer to para 4.17.
		Control PC board malfunctioning.	Unplug condensing tank water level sensor connector from Control PC board, start a cycle, and observe. WATER LOW lamp should flash after approximately 5 minutes.	Replace control PC board. Refer to para 4.12.
	WATER LOW indicator illuminates, but chamber is overfilled with water.	Temperature sensor is malfunctioning, causing water sensor circuit to malfunction (preventing water level sensor from detecting water).	Replace suspect temperature sensor with known working temperature sensor.	Replace temperature sensor. Refer to para 4.8.

© Midmark Corporation 1998 SF-1573 Rev. 11/99

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
DOOR AJAR lamp illuminates	DOOR AJAR lamp illuminates after a cycle is started.	Door is open.	Check door to ensure it is closed and latched completely.	Inform operator that door must be closed and latched completely.
		Door switch is malfunctioning - open circuit.	Perform continuity check on N.O. door switch (door closed = tripped switch = closed circuit).	Replace suspect door switch. Refer to para 4.13.
		Door switch connection loose.	Check door switch connection.	Clean any dirty connections, tighten any loose connections, and replace damaged connections.
		Door switch spring movement hampered.	Check for free door switch spring movement.	Clean / replace door switch spring.
Sterilizer has no power.	No response when ON/STANDBY is pushed (no lamps illuminate).	Sterilizer is not plugged in.	Check that power cord is plugged in to sterilizer and outlet.	Plug in power cord to sterilizer or outlet.
		Fuse blown on control PC board.	Perform continuity check on control PC board fuses.	Replace fuses.
		Thermostat activated.	Check for voltage at input to control PC board from thermostat.	Wait for sterilizer to cool. Re-check voltage. If none, replace thermostat. Refer to para 4.14.
Display PC board does not work.	Sterilizer works fine, but display does not work.	Power surge or fluctuation.	Unplug power cord from sterilizer. Wait 5 seconds and then replug power cord into sterilizer.	If problem persists, replace display PC board. Refer to para 4.19.
Sterilizer malfunctions during filling portion of cycle.	Pressure vessel will not fill or fills slowly with water during filling portion of cycle.	Pressure vessel water level sensor wet from previous cycle - causing fill cycle to be skipped.	Check pressure vessel water level sensor area for moisture.	Allow pressure vessel water level sensor to air dry or remove and hand dry. Refer to para 4.9.
		Pressure vessel water level sensor malfunctioning or dirty.	Perform continuity check on pressure vessel water level sensor.	Clean / replace pressure vessel water level sensor. Refer to para 4.9.
		Fill solenoid valve is plugged.	Check for plugged fill solenoid valve.	Clean / replace fill solenoid valve. Refer to para 4.11.
		Filter / tubing plugged.	Remove filter and tubing and inspect.	Clean / replace filter and/or tubing. Refer to para 4.17.
	Pressure vessel over fills with water during filling portion of cycle.	Fill solenoid valve malfunctioning or stuck.	Check resistance of solenoid coil: 240V unit - 818 ohms	Clean / replace fill solenoid valve. Refer to para 4.11.
		Pressure vessel water level sensor malfunctioning or dirty.	Perform continuity check on pressure vessel water level sensor with and without water on sensor. With water, there should be continuity, without none.	Clean / replace pressure vessel water level sensor. Refer to para 4.9.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Sterilizer malfunctions during filling portion of cycle - Continued.	Pressure vessel over fills with water during filling portion of cycle - Continued.	Control PC board malfunctioning.	If continuity check of pressure vessel water level sensor is okay, replace control PC board.	Replace control PC board. Refer to para 4.12.
		Loose, broken, or dirty connection between pressure vessel water level sensor and control PC board.	Perform continuity check between connector and pressure vessel water level sensor. Also, check that ground screw on PC control board is present and securely tightened.	Clean / replace broken wires or connections. Replace or tighten ground screw on PC control board.
		Sterilizer is not level.	Check sterilizer for level installation.	Re-install sterilizer on a level surface, adjust height of individual foot levelers, or shim up sterilizer.
Sterilizer not drying instruments properly.	Instruments are wet after drying cycle is complete.	Air compressor is malfunctioning.	Replace air compressor with known working air compressor.	Replace air compressor. Refer to para 4.27.
		HEPA filter is clogged / dirty.	Check for dirty / clogged HEPA filter (HEPA filter should be replaced every 12 months).	Replace HEPA filter. Refer to para 4.26.
		Dry air inlet solenoid valve is malfunctioning.	Replace dry air inlet solenoid valve with known working valve.	Replace dry air inlet solenoid valve. Refer to para 4.28.
		Dry air outlet solenoid valve is malfunctioning.	Replace dry air outlet solenoid valve with known working valve.	Replace dry air outlet solenoid valve. Refer to para 4.29.
		Sterilizer is not level.	Check sterilizer for level installation.	Re-install sterilizer on a level surface, adjust height of individual foot levelers, or shim up sterilizer.
		Filter is plugged.	Check that no water is left in pressure vessel after venting portion of cycle.	Replace/clean filter. Refer to para 4.17.
		Facility volatge level to unit is too low.	Check facility volatge level - should be 220 - 245 VAC.	Try to correct facility voltage level problem.
Steam does not exhaust from pressure vessel or exhausts slowly.	Dry cycle begins after a longer than normal venting period.	Pressure vessel drain, filter, or vent piping plugged.	Remove filter and tubing and inspect.	Clean, drain, and flush tubing. Replace/clean filter. Refer to para 4.17.
		Vent solenoid malfunctioning or stuck.	Replace suspect vent solenoid with known working vent solenoid.	Replace/clean vent solenoid. Refer to para 4.10.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Door is obstructed/binding.	Door is hard to open or close.	Door panel needs adjusted.	Check for interference.	Loosen door panel screws, adjust door, and tighten screws.
		Door latch binding.	Operate door latch by hand to check for resistance.	Clean/lubricate door latch.
		Steam block hitting inside of door cover.	Check for interference.	Loosen screws, adjust steam block, and tighten screws.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION III
SCHEDULED MAINTENANCE

3.1 Scheduled Maintenance

Table 3-1 is a Scheduled Maintenance Chart which lists the inspections and services that should be performed periodically on the sterilizer. These inspections and services should be performed as often as indicated in the chart.

Table 3-1. Scheduled Maintenance Chart

Interval	Inspection or Service	What to Do
Semi-annually	Obvious damage	Visually check condition of sterilizer for obvious damage such as: cracks in components, missing components, dents in components, leaks, or any other visible damage which would cause sterilizer to be unsafe to operate or would compromise the performance of the sterilizer. Repair sterilizer if necessary.
	Fasteners/hardware	Check sterilizer for missing or loose fasteners/hardware. Replace any missing hardware and tighten any loose hardware as necessary using Loctite 271 if necessary.
	Moving parts	All moving parts should be lubricated with high temperature grease.
	Warning and instructional decals	Check for missing or illegible decals. Replace decals as necessary.
	Display overlay	Check for missing, damaged, or illegible display overlay. Replace display overlay if necessary.
	Wiring connections	Check the integrity of all wiring connections. Clean all dirty connections. Tighten any loose connections. Replace any damaged connections.
	Free movement of door latch	Clean door latch. Lubricate door latch and door pins with high temperature grease.
	Free movement of door switch spring	Clean door switch spring. Lubricate door switch spring with high temperature grease. Replace door switch spring if necessary.
	Latch lever	Operate latch lever by hand to check for resistance. Clean latch lever. Lubricate latch lever with high temperature grease.
	Door and Dam gaskets	Remove gaskets and check for dirt on gaskets, deterioration of gaskets, or voids in gaskets. Clean gaskets using a mild soap and water solution. Replace gaskets if necessary. Refer to para 4.18.
	Chamber Filter	Clean filter using a mild soap and water solution. Replace filter if necessary. Refer to para 4.17.
	Pressure vessel water level sensor	Remove any build-up from pressure vessel water level sensors. Replace sensor if necessary. Refer to para 4.9.
	Tubing	Remove tubing and inspect for buildup. Clean, drain, and flush tubing. Replace tubing if necessary.
	Display PC board	Perform the display PC board lamp/display/button check. Refer to para 4.23. Replace display PC board if necessary.
	Pressure relief valve	Perform a pressure relief valve check. Refer to para 4.21. Replace pressure relief valve if necessary. Refer to para 4.24.
	Printer (optional equipment)	Check that printer prints properly. Replace ribbon cartridge if necessary. Replace printer if necessary. Refer to Installation and Operation Manual.
	Operational test	Perform an operational test to determine if the sterilizer is operating within its specifications (Refer to para 2.1). Replace any malfunctioning components. Adjust the control PC board potentiometers if necessary. Refer to para 4.22.
Annually	HEPA filter	Replace HEPA filter. Refer to para 4.26.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Return To Table Of Contents

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE INSTRUCTIONS

4.1 Introduction

WARNING
Always disconnect the power cord from the outlet before removing any of the sterilizer covers/panels or making any repairs to prevent the possibility of electrical shock. Also, drain the sterilizer to prevent spills during repairs. Failure to comply with these instructions could result in serious personal injury or death.

The following paragraphs contain replacement, repair, and adjustment procedures for the sterilizer.

4.2 Top Cover Removal / Installation

A. Removal

(1) Disconnect power cord from the outlet.

(2) If the sterilizer contains a printer, remove printer (Refer to Operation Manual).

(3) Open sterilizer door.

(4) Remove two screws (1, Figure 4-1) and steam block (2) from top cover (3).

(5) Remove four screws (4) and two screws (5) from top cover (3).

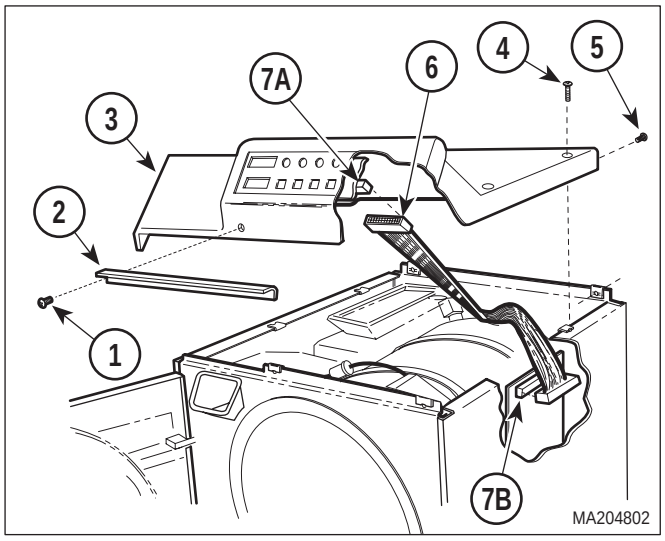


Figure 4-1. Top Cover Removal / Installation

(6) On units which apply, carefully break front of top cover (3) loose from silicone sealant.

EQUIPMENT ALERT
Lift top cover carefully and slowly. Ribbon connector is still connected to display PC board and any excess pressure exerted on it could result in a damaged ribbon connector or display PC board.

(7) Lift rear of top cover (3) and disconnect ribbon connector (6) from display PC board (7A) or control PC board (7B) (depending on whether ribbon connector (6) is part of display PC board or is a separate component).

(8) Remove top cover (3) from sterilizer.

B. Installation

NOTE
Old style top covers (smooth plastic) use silicone sealant to prevent steam from flowing up over the display board. New style top covers (textured plastic) have an extra ridge, preventing the unwanted steam flow over the display board; silicone sealant is not needed for these top covers.

(1) If applicable, coat mating surfaces of front panel lip and top cover (3) with silicone sealant.

(2) Position top cover (3) over sterilizer, with rear of top cover raised, and connect ribbon connector (6) to display PC board (7A) or control PC board (7B).

(3) Install top cover (3) on sterilizer and secure using two screws (5) and four screws (4).

(4) Install steam block (2) on top cover (3) and secure using two screws (1).

(5) Close sterilizer door.

(6) If the sterilizer contains a printer, install printer (Refer to Installation and Operation Manual).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE

4.3 Right Hand Side Panel Removal / Installation

A. Removal

(1) Disconnect power cord from the outlet.

(2) Remove two screws (1, Figure 4-2) from top cover (2).

(3) Pull outward and down on the top edge of the right hand side panel (3) and remove right hand side panel from sterilizer.

B. Installation

(1) Insert two tabs of right hand side panel (3) into two slots of base (4).

(2) Raise top edge of right hand side panel (3) into position and secure using two screws (1).

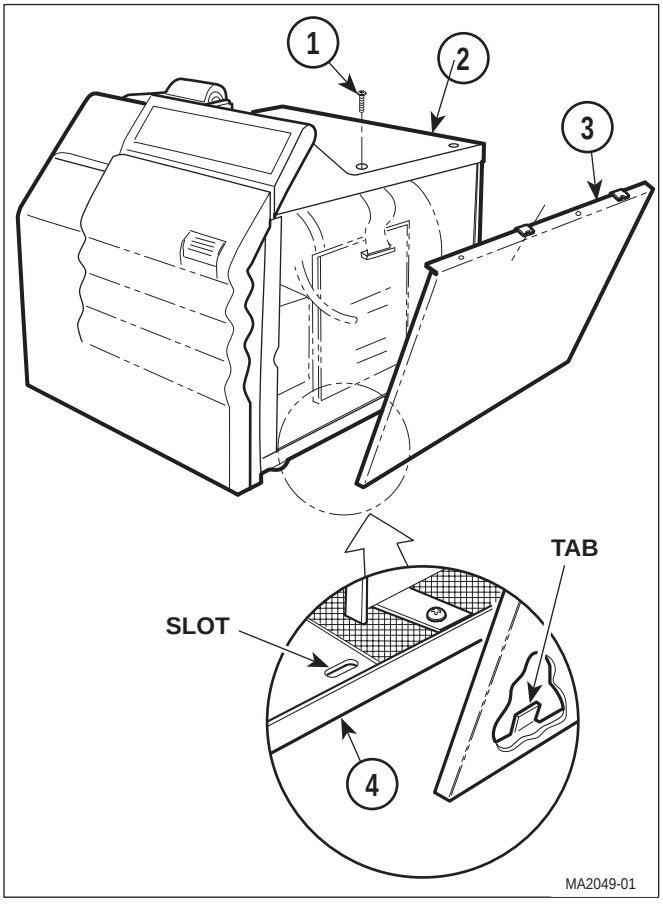


Figure 4-2. Right Hand Side Panel Removal / Installation

4.4 Left Hand Side Panel Removal / Installation

A. Removal

(1) Disconnect power cord from the outlet.

(2) Open sterilizer door.

(3) Remove left screw (1, Figure 4-3) from steam block (2).

(4) Remove two screws (3) from top cover (4).

(5) Lift up the left hand corner of top cover (4); then pull outward and down on the top edge of the left hand side panel (5) and remove left hand side panel from sterilizer.

B. Installation

(1) Insert two tabs of left hand side panel (5) into two slots of base (6).

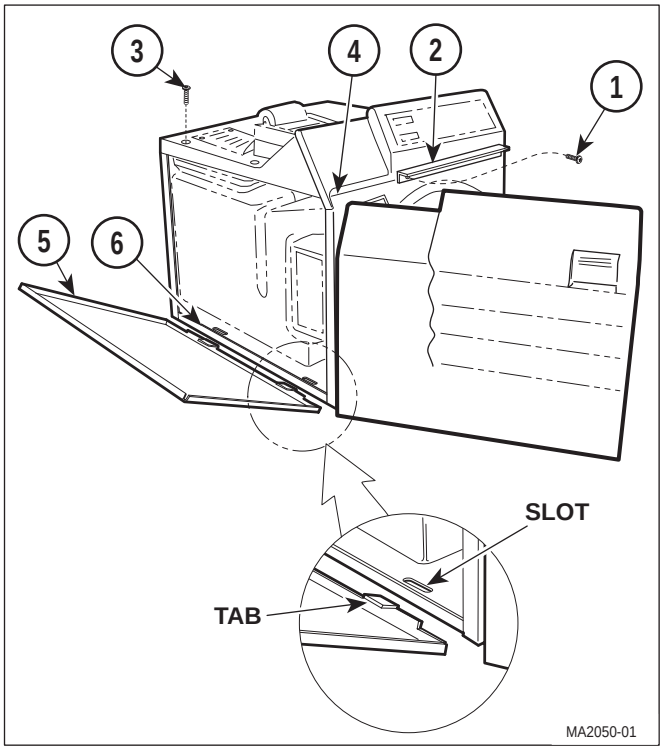


Figure 4-3. Left Hand Side Panel Removal / Installation

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(2) Lift up the left hand corner of top cover (4), raise the top edge of left hand side panel (5) into position, and secure using two screws (3).

(3) Install left screw (1) on steam block (2).

(4) Close sterilizer door.

4.5 Back Panel Removal / Installation

A. Removal

(1) Disconnect power cord from sterilizer.

(2) Remove right hand side panel (Refer to para 4.3).

(3) Remove left hand side panel (Refer to para 4.4).

(4) Remove four screws (1, Figure 4-4) from back panel (2).

(5) Partially remove back panel (2) by simultaneously pulling downward and outward on back panel.

EQUIPMENT ALERT
Ensure that wires are completely disconnected before attempting to remove back panel. Failure to do so could result in damage to sterilizer.

(6) Tag and disconnect three wires (3) from terminals of receptacle (4) and remove back panel (2) from sterilizer.

B. Installation

(1) Connect three wires (3) to terminals of receptacle (4).

(2) Position flap of back panel (2) behind top cover (5) and secure back panel in place using four screws (1).

(3) Install left hand side panel (Refer to para 4.4).

(4) Install right hand side panel (Refer to para 4.3).

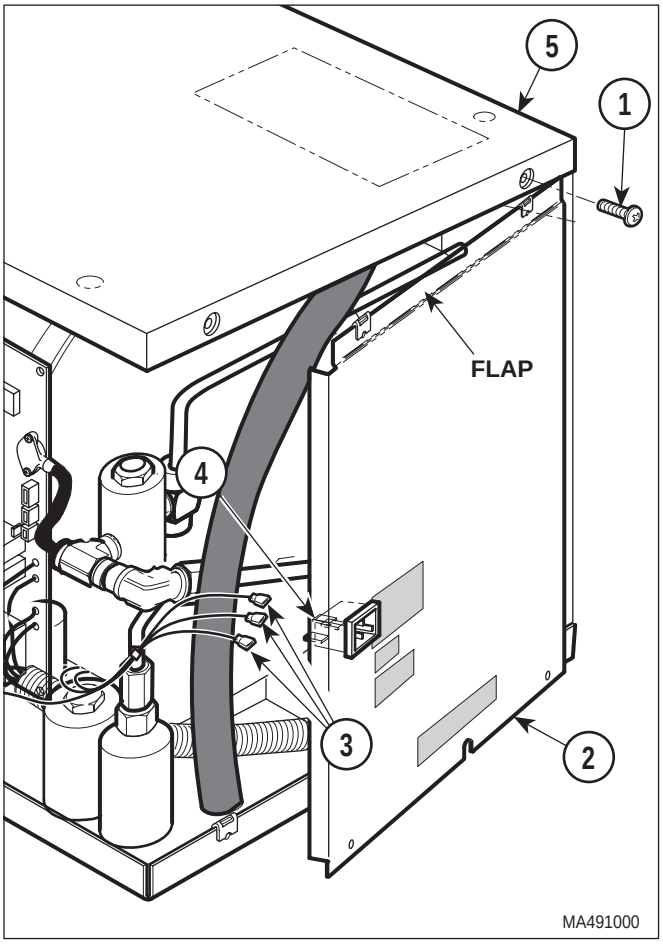


Figure 4-4. Back Panel Removal / Installation

4.6 Base Inspection Cover Removal / Installation

A. Removal

(1) Disconnect power cord from outlet.

(2) Drain water from condensing tank.

(3) Turn sterilizer onto its back.

(4) Remove two screws (1, Figure 4-5) and base inspection cover (2) from base (3).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

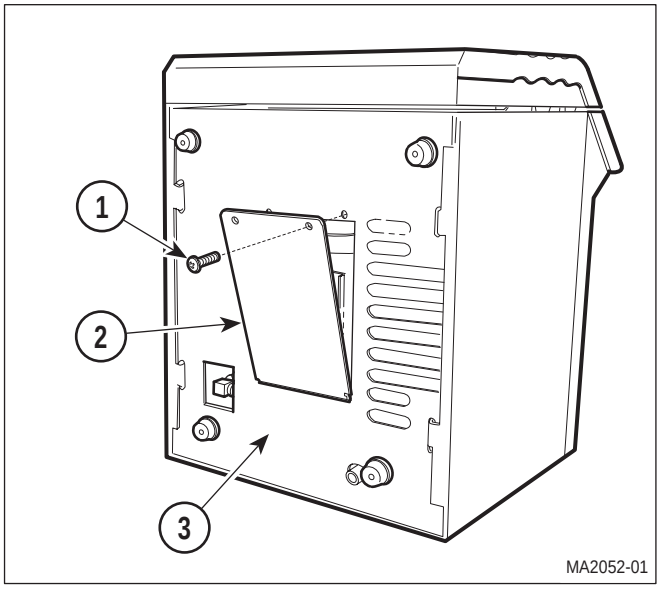


Figure 4-5. Base Inspection Cover Removal / Installation

B. Installation

(1) Install base inspection cover (2) on base (3) and secure using two screws (1).

(2) Turn sterilizer upright.

(3) Refill condensing tank with distilled water.

4.7 Bellows Assembly Removal / Installation

A. Removal

(1) Remove back panel (Refer to para 4.5).

(2) Disconnect tube (1, Figure 4-6) from tee (2).

(3) Pull downward on bellows assembly (3) to remove bellows assembly from condensing tank (4).

(4) Loosen and remove tubes (1 and 5) from bellows assembly (3).

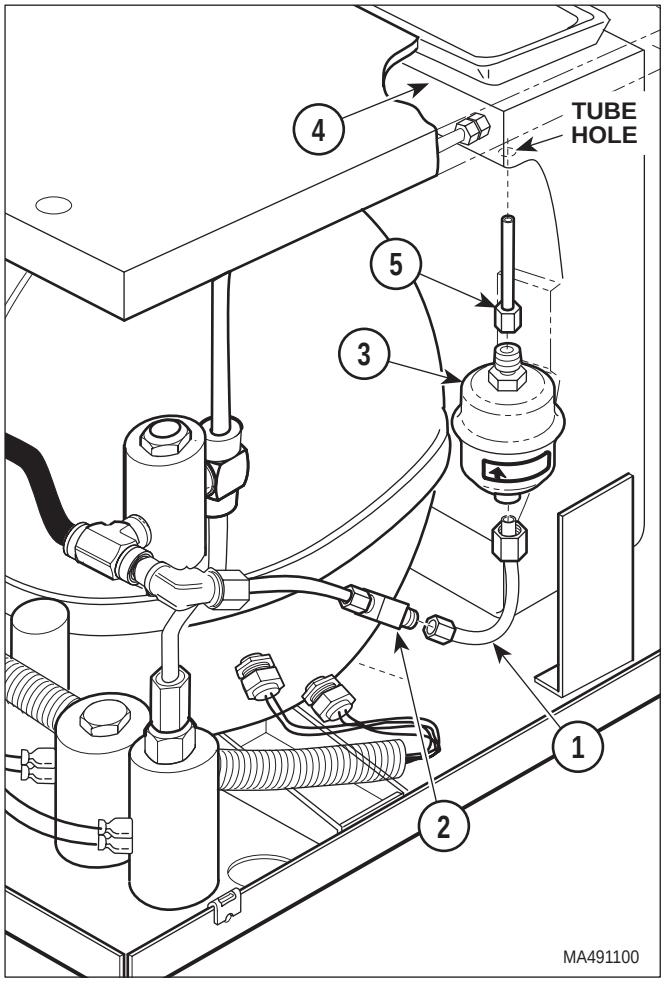


Figure 4-6. Bellows Assembly Removal / Installation

B. Installation

(1) Connect tubes (1 and 5) to bellows assembly (3).

(2) Position bellows assembly (3) and insert tube (5) into tube hole of condensing tank (4).

(3) Connect tube (1) to tee (2).

(4) Install back panel (Refer to para 4.5).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

4.8 Temperature Sensor Assembly Removal / Installation

A. Removal

(1) Remove back panel (Refer to para 4.5).

(2) Disconnect two wire harnesses (1, Figure 4-7) from two terminals (2).

(3) Remove flex guard tubing (3) from two wire harnesses (1).

(4) Remove temperature sensor assembly (4) from pressure vessel (5).

B. Installation

(1) Coat threads of temperature sensor assembly (4) with teflon tape.

(2) Install temperature sensor assembly (4) in pressure vessel (5).

(3) Install flex guard tubing (3) on two wire harnesses (1).

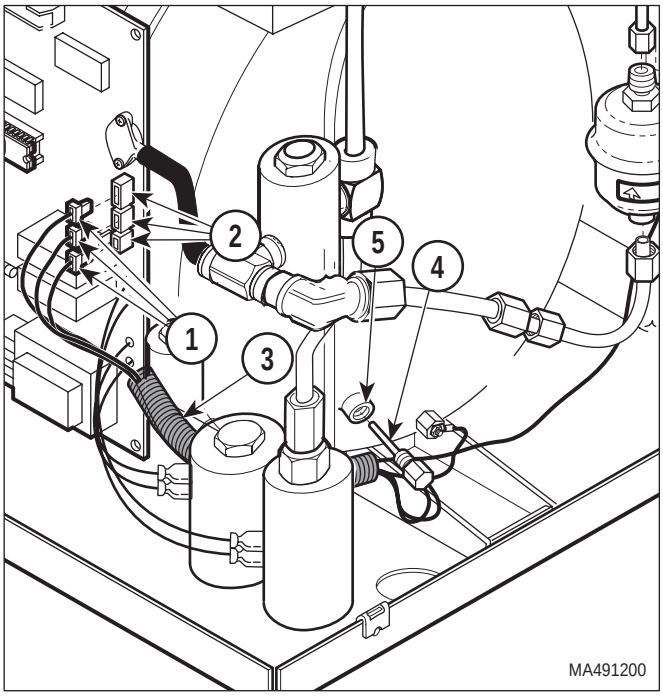


Figure 4-7. Temperature Sensor Assembly Removal / Installation

(4) Connect two wire harnesses (1) to two terminals (2).

(5) Install back panel (Refer to para 4.5).

4.9 Pressure Vessel Water Level Sensor Removal / Installation

A. Removal

(1) Remove back panel (Refer to para 4.5).

(2) Remove wire tray rack and tray plate (Refer to para (4.15).

(3) Disconnect wire (1, Figure 4-8) from terminal (2).

(4) Remove nut (3) and terminal (2) from level sensor rod (4).

(5) Remove nut (5).

EQUIPMENT ALERT
Do not try to pull level sensor rod out of back side of pressure vessel. Doing so will damage level sensor rod.

(6) Push level sensor rod (4) thru fitting (6) and into pressure vessel (7) and remove level sensor rod.

(7) Remove spacer (8) from level sensor rod (4).

(8) Remove silicone tube (9) from fitting (6). Discard silicone tube (9) and crimp (10).

(9) If damaged, remove fitting (6) from pressure vessel (7).

B. Installation

(1) If removed, coat fitting (6) with teflon tape and install fitting in pressure vessel (7).

(2) Install silicone tube (9) and spacer (8) on level sensor rod (4).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

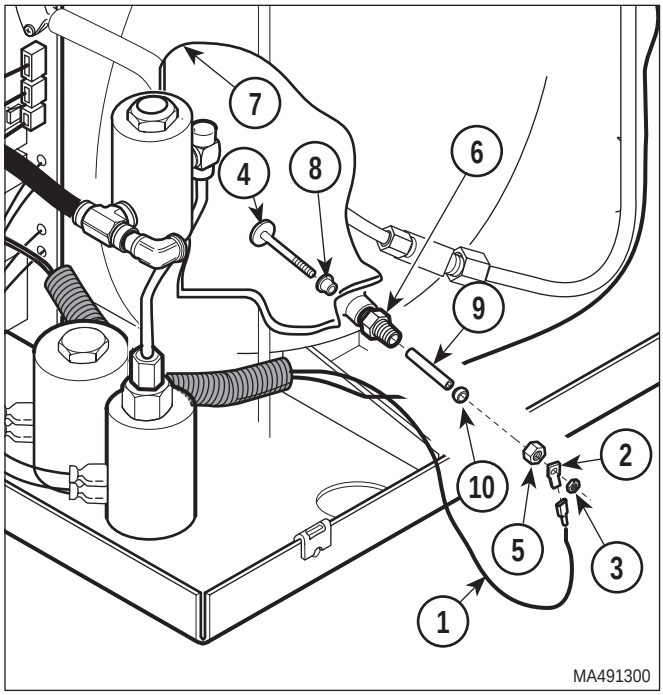


Figure 4-8. Pressure Vessel Water Level Sensor Removal / Installation

NOTE
The assembled level sensor rod must be installed from the inside of the pressure vessel.

(3) Install assembled level sensor rod (4) in fitting (6).

EQUIPMENT ALERT
The end of the silicone tube must extend past nut (5) after nut is installed. If it is not, the level sensor rod will not function properly because the terminal will be in contact with nut (5).

(4) Install and crimp crimp (10) on silicone tube (9).

(5) Install nut (5).

(6) Install terminal (2) on level sensor rod (4) and secure using nut (3).

(7) Connect wire (1) to terminal (2).

(8) Install wire tray rack and tray plate (Refer to para 4.16).

(9) Install back panel (Refer to para 4.5).

4.10 Vent Solenoid Removal / Installation

A. Removal

(1) Drain water from condensing tank.

(2) Remove back panel (Refer to para 4.5).

(3) Tag and disconnect two wires (1, Figure 4-9) from terminals (2).

(4) Tag and disconnect two wires (3) from terminals (4).

(5) Tag and disconnect two wires (5) from terminals (6).

(6) Disconnect three tubes (7 thru 9) from fittings (10 thru 12).

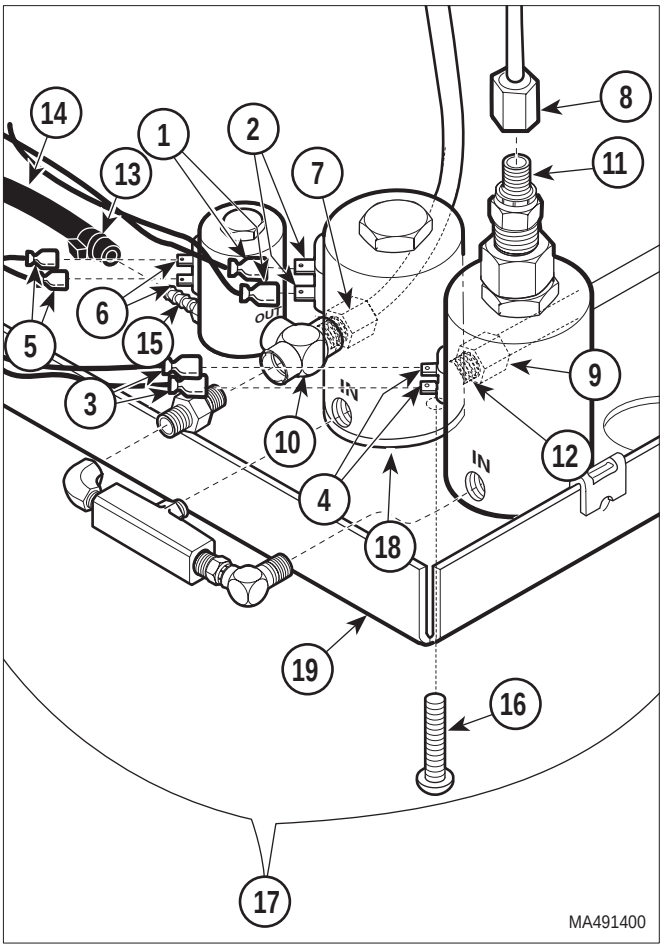


Figure 4-9. Vent Solenoid Removal / Installation

(7) Cut cable tie (13) and disconnect tube (14) from male barb fitting (15).

(8) Remove two screws (16) from bottom of manifold assembly (17).

(9) Remove manifold assembly (17) and spacer (18) from base (19).

(10) Remove fitting (1, Figure 4-10) from vent solenoid (2).

(11) Loosen nut (3) and turn terminals (4) out of the way.

(12) Remove assembled vent solenoid (2) and elbow (5) from fitting (6).

(13) Remove elbow (5) from vent solenoid (2).

B. Installation

(1) Coat the threads of elbow (5, Figure 4-10) with teflon tape.

(2) Install elbow (5) on vent solenoid (2).

(3) Loosen nut (3) and turn terminals (4) out of the way.

(4) Install assembled elbow (5) and vent solenoid (2) on tee (6).

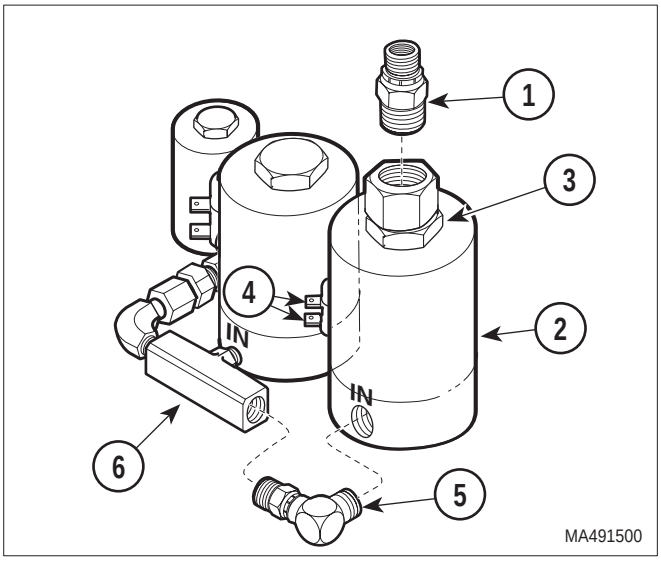


Figure 4-10. Vent Solenoid Fittings Removal / Installation

(5) Turn terminals (4) of vent solenoid (2) so wires will connect easily to vent solenoid; then tighten nut (3).

(6) Coat threads of fitting (1) with teflon tape; then install fitting (1) on vent solenoid (2).

EQUIPMENT ALERT
When installing the vent solenoid, the side of the solenoid marked IN needs to be connected to the pressure line. Reversing vent solenoid will cause system failure.

(8) Install spacer (18, Figure 4-9) and manifold assembly (17) on base (19) and secure using two screws (16).

(9) Connect tube (14) to male barb fitting (15) and secure with cable tie (13).

(10) Connect three tubes (7 thru 9) to fittings (10 thru 12).

(11) Connect two wires (5) to terminals (6).

(12) Connect two wires (3) to terminals (4).

(13) Connect two wires (1) to terminals (2).

(14) Install back panel (Refer to para 4.5).

(15) Refill condensing tank with distilled water.

4.11 Fill Solenoid Removal / Installation

A. Removal

(1) Drain water from condensing tank.

(2) Remove back panel (Refer to para 4.5).

(3) Tag and disconnect two wires (1, Figure 4-11) from terminals (2).

(4) Tag and disconnect two wires (3) from terminals (4).

(5) Tag and disconnect two wires (5) from terminals (6).

(6) Disconnect three tubes (7 thru 9) from fittings (10 thru 12).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(7) Cut cable tie (13) and disconnect tube (14) from male barb fitting (15).

(8) Remove two screws (16) from bottom of manifold assembly (17).

(9) Remove manifold assembly (17) and spacer (18) from base (19).

(10) Loosen nut (1, Figure 4-12) and turn terminals (2) out of the way.

(11) Remove assembled vent solenoid (3) and elbow (4) from tee (5).

(12) Remove dry air inlet solenoid valve assembly (6) from tee (5).

(13) Remove tee (5) from fill solenoid (7).

(14) Remove fitting (8) from fill solenoid (7).

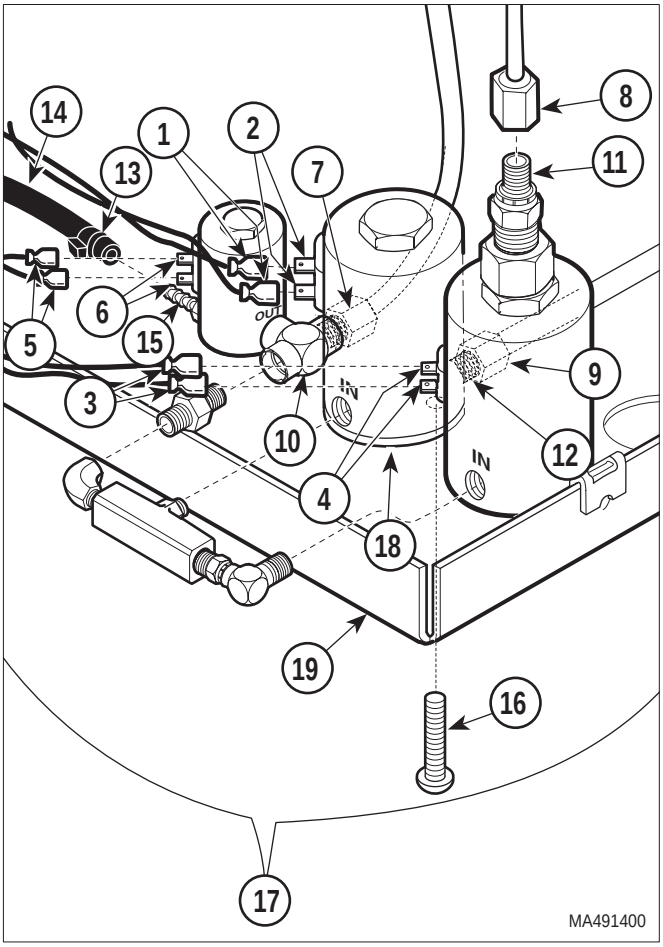


Figure 4-11. Fill Solenoid Removal / Installation

B. Installation

(1) Coat threads of tee (5, Figure 4-12), elbow (4), fitting (8), and fitting (6) with teflon tape.

(2) Install fitting (8) and tee (5) on fill solenoid (7).

(3) Install dry air inlet solenoid valve assembly (6) on tee (5).

(4) Loosen nut (9). Turn terminals (10) of fill solenoid (7) so wires will connect easily to fill solenoid. Tighten nut (9).

(5) Loosen nut (1) and turn terminals (2) out of the way.

(6) Install assembled elbow (4) and vent solenoid (3) on tee (5).

(7) Turn terminals (2) of vent solenoid so wires will connect easily to vent solenoid; then tighten nut (1).

EQUIPMENT ALERT
When installing the vent solenoid, the side of the solenoid marked IN needs to be connected to the pressure line. Reversing vent solenoid will cause system failure.

(8) Install spacer (18, Figure 4-9) and manifold assembly (17) on base (19) and secure using two screws (16).

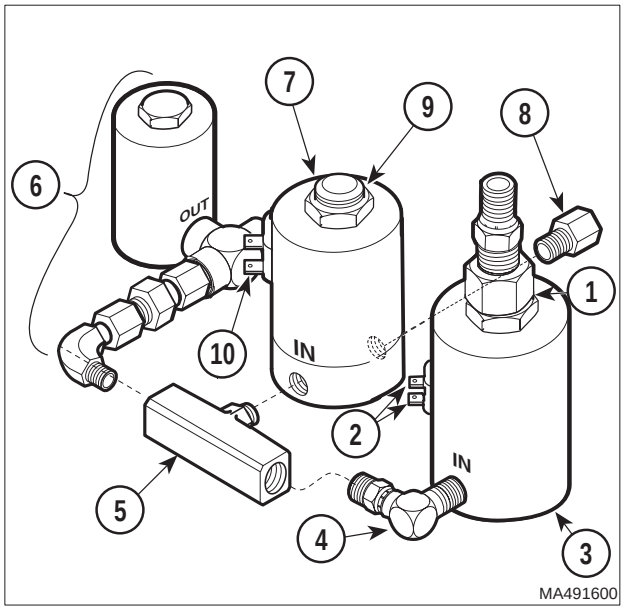


Figure 4-12. Fill Solenoid Fittings Removal / Installation

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(9) Connect tube (14) to male barb fitting (15) and secure with cable tie (13).

(10) Connect three tubes (7 thru 9) to fittings (10 thru 12).

(11) Connect two wires (5) to terminals (6).

(12) Connect two wires (3) to terminals (4).

(13) Connect two wires (1) to terminals (2).

(13) Install back panel (Refer to para 4.5).

(14) Refill condensing tank with distilled water.

4.12 Control PC Board Removal / Installation

A. Removal

(1) Remove right hand side panel (Refer to para 4.3).

(2) Disconnect pressure tube (1, Figure 4-13) from pressure sensor (2).

(3) Disconnect two wire harnesses (3) from two connectors (4).

(4) Tag and disconnect two wires (5) from terminals (6).

(5) Tag and disconnect two wires (7) from terminals (8).

(6) Disconnect ribbon connector (9) from connector (10).

(7) Tag and disconnect neutral wire (11) from terminal (12).

(8) Tag and disconnect hot wire (13) from terminal (14).

(9) Disconnect printer cable (15) from connector (16).

(10) Disconnect door switch harness (17) from connector (18).

(11) Tag and disconnect two wires (19) from wires (20).

(12) Disconnect heater element wire (21) from connector (22).

(13) Remove two locknuts (1, Figure 4-14), screws (2), and control PC board (3) and control PC board bracket (4) as an assembly from base (5).

(14) Remove locknut (6) and screw (7) from control PC board bracket (4).

(15) Turn three standoff screws (8) 1/4 turn in the counter-clockwise direction and remove control PC board (3) and insulator (9) from control PC board bracket (4).

B. Installation

(1) Install insulator (9, Figure 4-14) and control PC board (3) on control PC board bracket (4) and secure by turning three standoff screws (8) 1/4 turn in the clockwise direction.

(2) Install screw (7) and locknut (6) on control PC board bracket (4).

(3) Install control PC board (3) and control PC board bracket (4) as an assembly on base (5) and secure using two screws (2) and locknuts (1).

(4) Connect heater element wire (21, Figure 4-13) to connector (22).

(5) Connect two wires (19) to wires (20).

(6) Connect wire harness (17) to connector (18).

(7) Connect printer cable (15) to connector (16).

(8) Connect hot wire (13) to terminal (14).

(9) Connect neutral wire (11) to terminal (12).

(10) Connect ribbon connector (9) to connector (10).

(11) Connect two wires (7) to terminals (8).

(12) Connect two wires (5) to terminals (6).

(13) Connect two wire harnesses (3) to two connectors (4).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

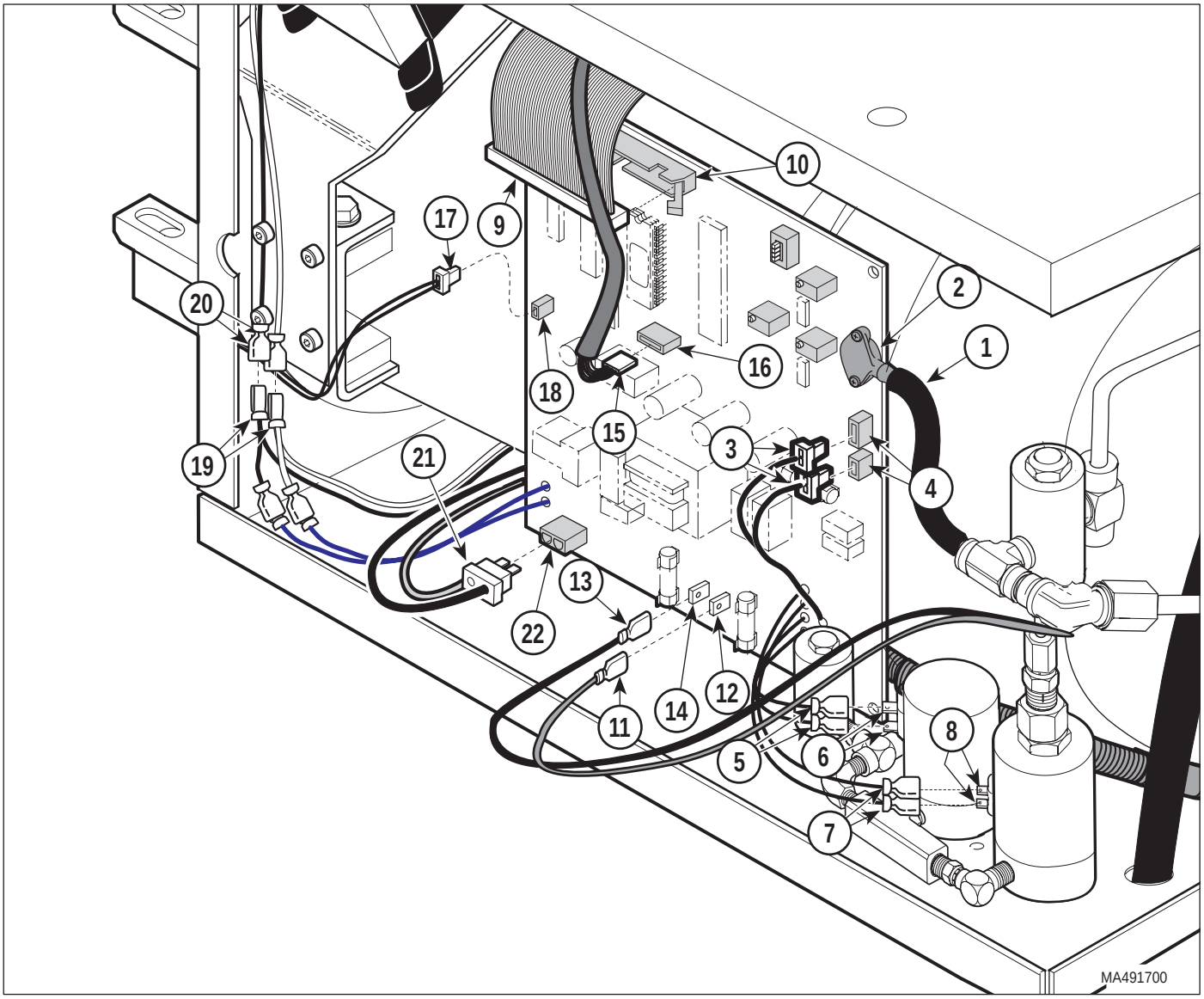


Figure 4-13. Control PC Board Connections

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

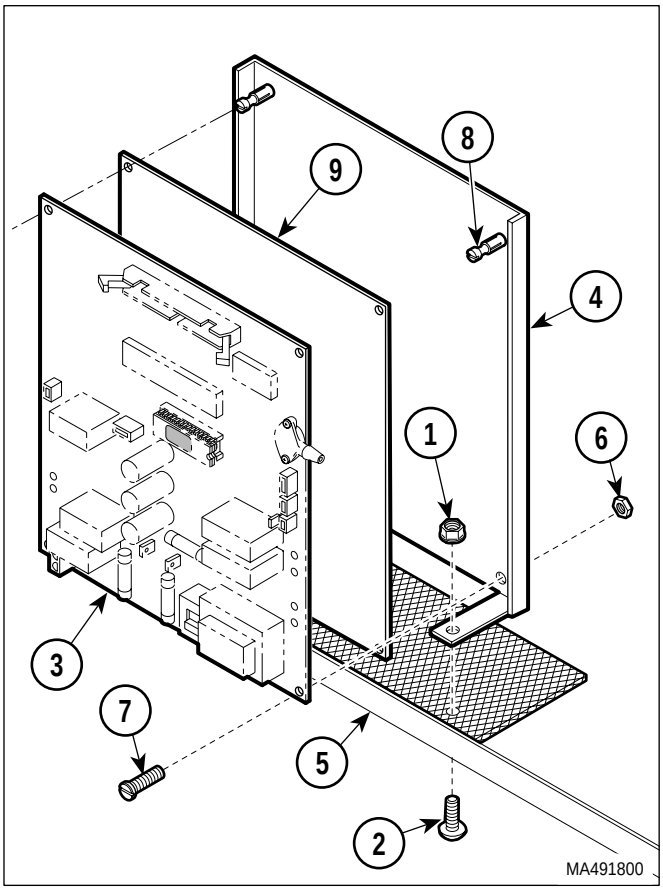


Figure 4-14. Control PC Board Removal / Installation

(14) Connect pressure tube (1) to pressure sensor (2).

(15) Install right hand side panel (Refer to para 4.3).

4.13 Door Switch Removal / Installation

A. Removal

(1) Open sterilizer door.

(2) Remove right hand side panel (Refer to para 4.3).

(3) Disconnect wire harness (1, Figure 4-15) from connector (2).

(4) Using 3/32 in. punch, remove two roll pins (3) from door switch bracket (4) (Refer to Table 1-2 for special tool).

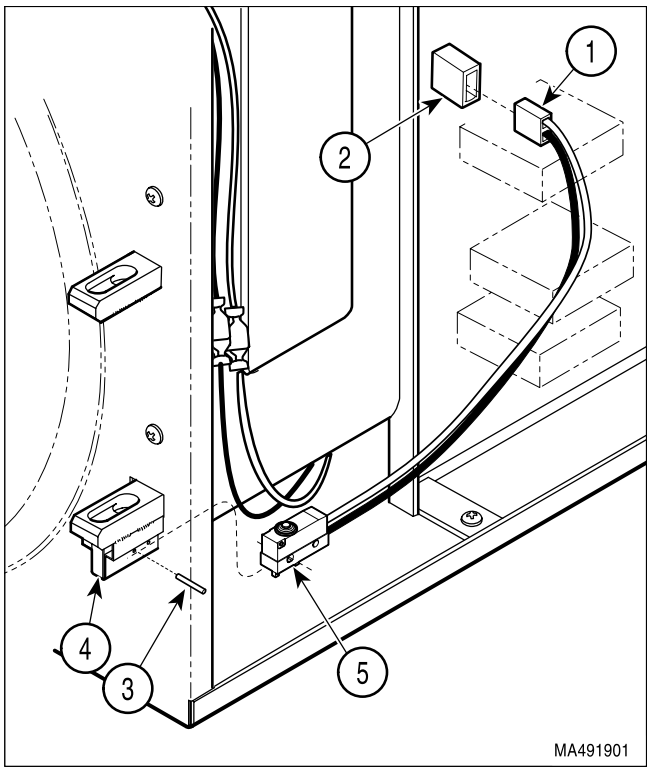


Figure 4-15. Door Switch Removal / Installation

(5) Remove door switch (5) from door switch bracket (4).

B. Installation

(1) Position door switch (5) in door switch bracket (4).

(2) Using 3/32 in. punch, install two roll pins (3) in door switch bracket (4) (Refer to Table 1-2 for special tool).

(3) Connect wire harness (1) to connector (2).

(4) Install right hand side panel (Refer to para 4.3).

(5) Close sterilizer door.

© Midmark Corporation 1998 SF-1573 Rev 9/00

Printed in U.S.A.

4.14 Thermostat Removal / Installation

A. Removal

(1) Drain water from condensing tank.

(2) Remove base inspection cover (Refer to para 4.6).

(3) Tag and disconnect wires (1 and 2, Figure 4-16) from terminals (3 and 4).

(4) Loosen two nuts (5) and pull top of bracket (6) approximately 1 in. from pressure vessel (7).

(5) Rotate terminals (3 and 4) to a vertical position and slide thermostat (8) upward and out of bracket (6).

B. Installation

(1) Slide thermostat (8) into bracket (6) and rotate terminals (3 and 4) to a horizontal position.

(2) Position bracket (6) against pressure vessel (7) and secure by tightening two nuts (5).

(3) Connect wires (1 and 2) to terminals (3 and 4).

(4) Install base inspection cover (Refer to para 4.6).

(5) Refill condensing tank with distilled water.

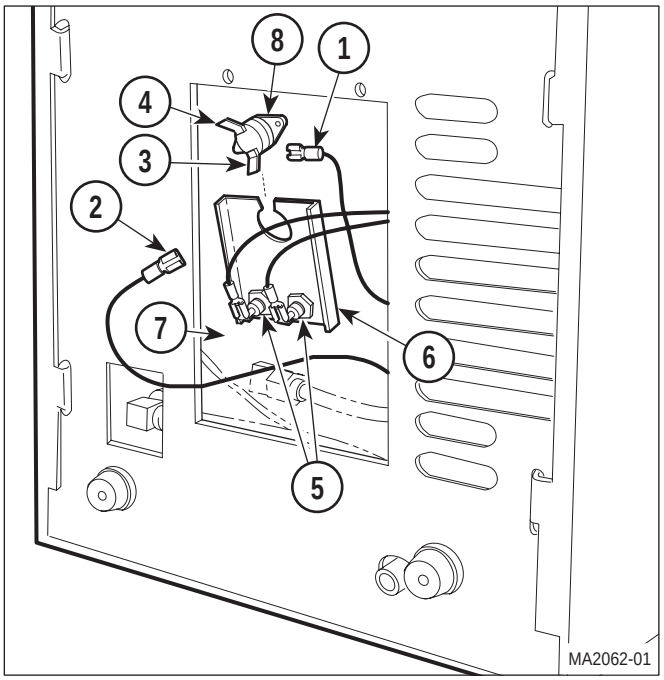


Figure 4-16. Thermostat Removal / Installation

4.15 Wire Tray Rack and Tray Plate Removal / Installation

A. Removal

(1) Open sterilizer door.

(2) Remove trays.

(3) Using a screwdriver or similar tool, carefully pry up on four posts (A, Figure 4-17) of wire tray rack (1), removing them from rack holes (B) of tray plate (2). Then, collapse the wire tray rack and remove it from chamber.

(4) Remove tray plate (2) from chamber.

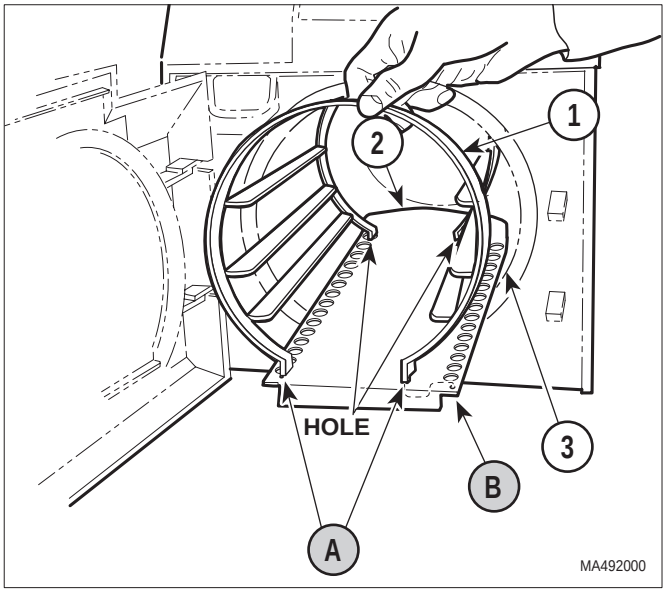


Figure 4-17. Wire Tray Rack and Tray Plate Removal / Installation

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

B. Installation

(1) Install tray plate (2) in chamber.

(2) Collapse the wire tray rack (1) and then insert wire tray rack inside chamber.

(3) Insert four posts (A) of wire tray rack (1) in rack holes (B) of tray plate (2).

(4) Install trays.

(5) Close sterilizer door.

4.16 Heating Element and Gasket Removal / Installation

A. Removal

(1) Drain water from condensing tank.

(2) Remove base inspection cover (Refer to para 4.6).

(3) Tag and disconnect two wires (1, Figure 4-18) from terminals (2).

(4) Remove two nuts (3), lock washers (4), and brass washers (5).

EQUIPMENT ALERT
Over bending may result in broken or cracked terminals.

NOTE
The following step is necessary to remove the heating element from the pressure vessel.

(5) Straighten terminals (2) slightly from the present 90° position to approximately a 10° straighter position.

(6) Remove bracket (6) from pressure vessel (7) and position out-of-way.

(7) Turn sterilizer upright.

(8) Remove wire tray rack and tray plate (Refer to para 4.15).

(9) Remove heating element (8) and spacer assembly (9) from pressure vessel (7).

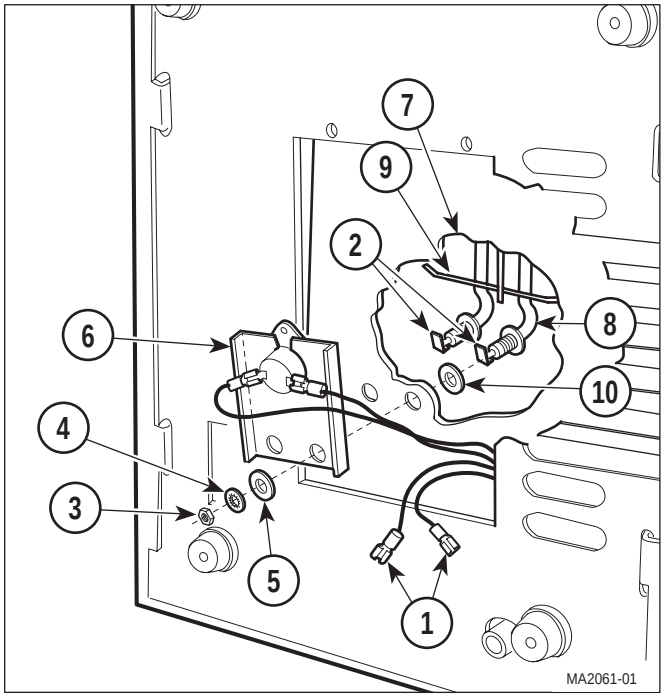


Figure 4-18. Heating Element and Gasket Removal / Installation

NOTE
Perform the following step only if the heating element is *not* being replaced, but damaged gaskets *are*.

(10) Remove two gaskets (10) from heating element (8).

B. Installation

(1) Install two gaskets (10) on heating element (8).

EQUIPMENT ALERT
Over bending may result in broken or cracked terminals.

NOTE
The following step is necessary to install the heating element in the pressure vessel.

(2) Straighten terminals (2) slightly from the present 90° position to approximately a 10° straighter position.

(3) Install spacer assembly (9) and heating element (8) in pressure vessel (7).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(4) Turn sterilizer on its back.

(5) Position bracket (6) on pressure vessel (7).

EQUIPMENT ALERT
Hold heating element firmly in position while tightening nuts. Otherwise, damage to heating element or improper positioning of heating element may result. Also, spacer assembly must remain above gaskets. If spacer assembly is installed under gasket, leaking will result.

(6) Install two brass washers (5), lock washers (4), and nuts (3) on heating element (8).

EQUIPMENT ALERT
Over bending may result in broken or cracked terminals.

(7) Bend terminals (2) slightly, back to their original 90° position.

(8) Connect two wires (1) to terminals (2).

(9) Turn sterilizer upright.

(10) Install wire tray rack and tray plate (Refer to para 4.15).

(11) Install base inspection cover (Refer to para 4.6).

(12) Refill condensing tank with distilled water.

4.17 Filter Removal / Installation

A. Removal

(1) Remove wire tray rack and tray plate (Refer to para 4.15).

NOTE
Turn filter in a circular motion while pulling upward to remove.

(2) Using vise grips and a clean cloth, remove filter (1, Figure 4-19) from pressure vessel (2).

B. Installation

(1) Position filter (1) in pressure vessel (2).

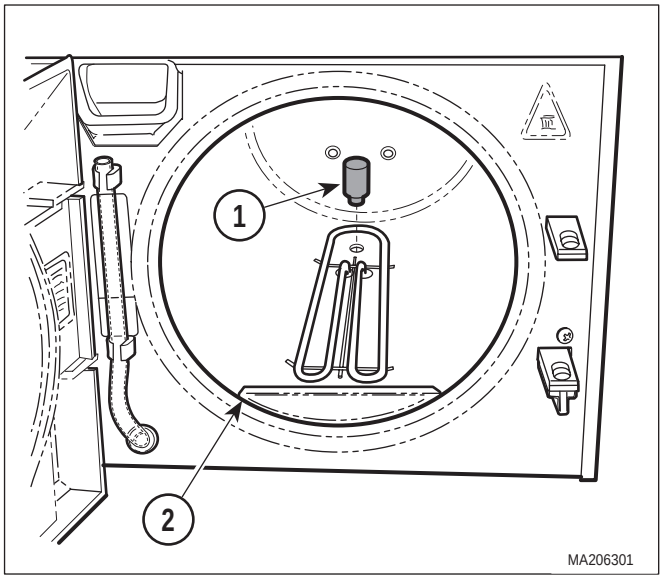


Figure 4-19. Filter Removal / Installation

(2) Using rubber hammer, tap filter (1) lightly into pressure vessel (2).

(3) Install wire tray rack and tray plate (Refer to para 4.15).

4.18 Door Gaskets Removal / Installation

A. Removal

(1) Open sterilizer door.

(2) Pull dam gasket (1, Figure 4-20) off of two studs (A) of door (2).

(3) Remove door gasket (3) from groove (B) of door (2).

B. Installation

(1) Install door gasket (3) in groove (B) on door (2).

(2) Install dam gasket (1) by inserting bottom edge of dam gasket in slot (C) of door gasket (3) while pushing dam gasket onto two studs (A).

(3) Close sterilizer door.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

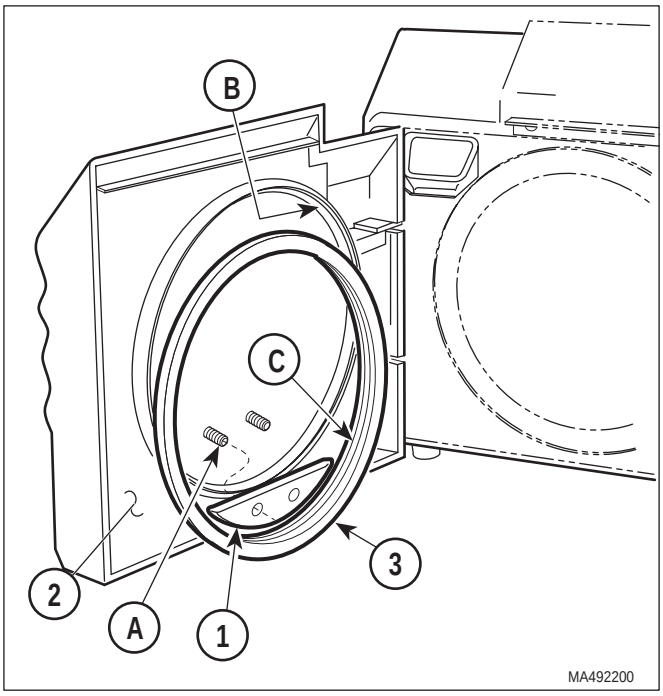


Figure 4-20. Door Gaskets Removal / Installation

4.19 Display PC Board Removal / Installation

A. Removal

(1) Remove top cover (Refer to para 4.2).

(2) Remove six screws (1, Figure 4-21) and display PC board (2) from top cover (3).

(3) If damaged, remove gasket (4) from top cover (3).

B. Installation

(1) If removed, install new gasket (4) by peeling protective backing off of gasket and pressing gasket firmly into position on top cover (3).

(2) Install display PC board (2) on top cover (3) and secure using six screws (1).

(3) Install top cover (Refer to para 4.2).

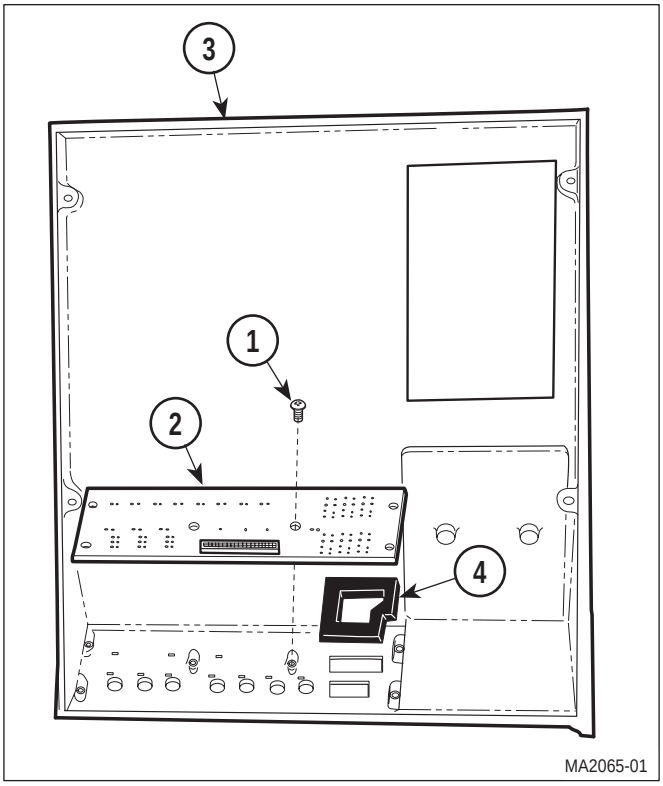


Figure 4-21. Display PC Board Removal / Installation

4.20 Condensing Tank Assembly Removal / Installation

A. Removal

(1) Drain water from condensing tank.

(2) Turn sterilizer onto its back.

(3) Disconnect fill tube (1, Figure 4-22) from elbow (2).

(4) Turn sterilizer upright.

(5) Remove top cover (Refer to para 4.2).

(6) Remove back panel (Refer to para 4.5).

(7) Remove bellows assembly (Refer to para 4.7).

(8) Disconnect vent tube (1, Figure 4-23) from fitting (2).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

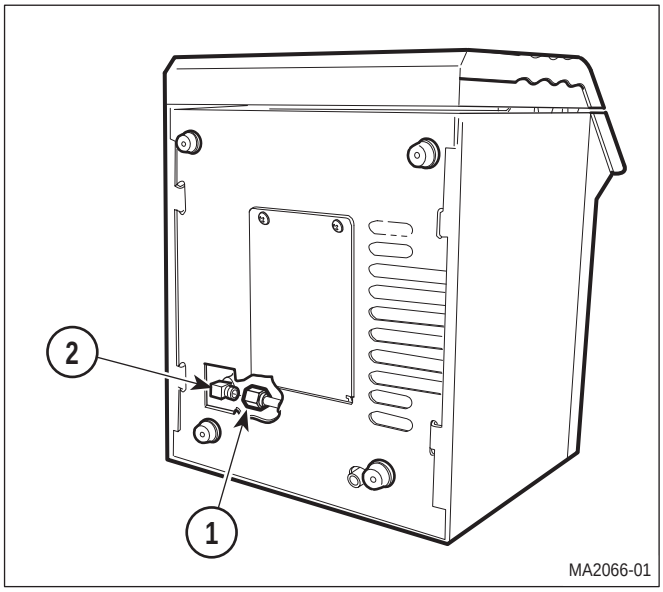


Figure 4-22. Condensing Tank Assembly Fill Tube Disconnection / Connection

(9) Remove screw (3), locknut (4), and condensing tank assembly (5) from base (6).

(10) Loosen hose clip (7) and then remove sight/drain tube (8) and hose clip from condensing tank assembly (5).

B. Installation

(1) Install sight/drain tube (8, Figure 4-23) on condensing tank assembly (5) and secure with hose clip (7).

(2) Position condensing tank assembly (5) in place, making sure to feed sight/drain tube (8) thru hole (A) in front panel.

NOTE
Fill tube must be lined up with fitting at this time because it will be impossible to line up after screw and locknut are installed.

(3) Secure condensing tank assembly (5) to base (6) with screw (3) and locknut (4).

(4) Connect vent tube (1) to fitting (2).

(5) Install bellows assembly (Refer to para 4.7).

(6) Install back panel (Refer to para 4.5).

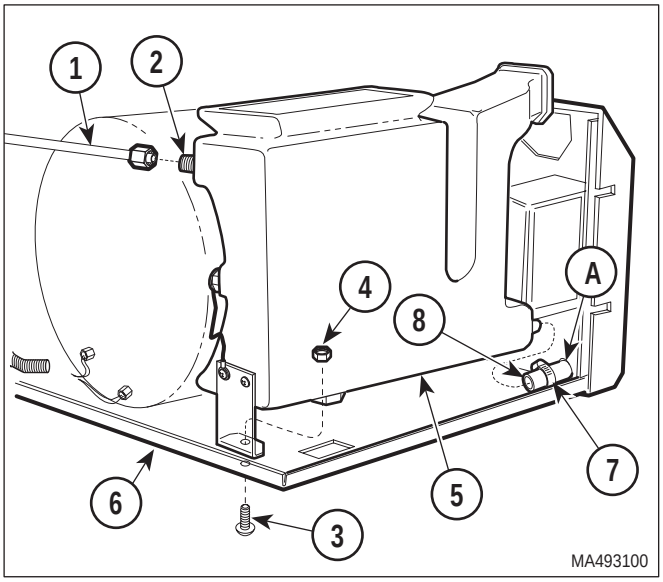


Figure 4-23. Condensing Tank Assembly Removal / Installation

(7) Install top cover (Refer to para 4.2).

(8) Turn sterilizer onto its side.

(9) Connect fill tube (1, Figure 4-22) to elbow (2).

(10) Turn sterilizer upright.

(11) Refill condensing tank with distilled water.

4.21 Pressure Relief Valve Removal / Installation

A. Removal

(1) Remove condensing tank assembly (Refer to para 4.20).

(2) Disconnect tube (1, Figure 4-24) from elbow (2).

(3) Remove elbow (2) from pressure relief valve (3).

(4) Remove pressure relief valve (3) from pressure vessel (4).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

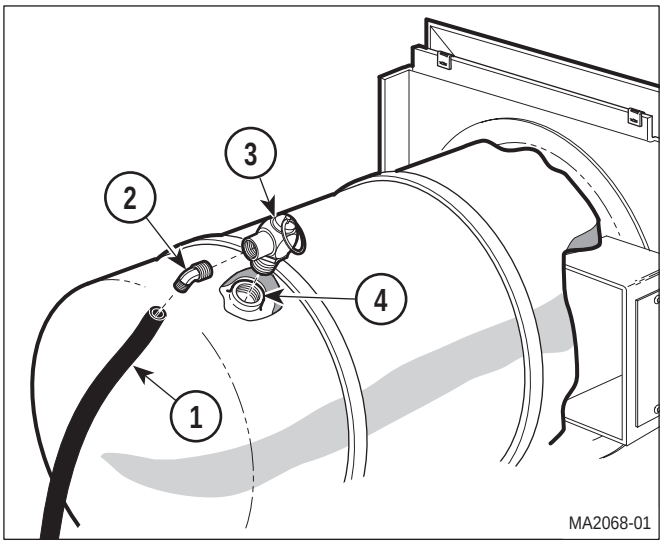


Figure 4-24. Pressure Relief Valve Removal / Installation

B. Installation

(1) Coat threads of pressure relief valve (3) and elbow (2) with teflon tape.

(2) Install pressure relief valve (3) in pressure vessel (4).

(3) Install elbow (2) on pressure relief valve (3).

(4) Connect tube (1) to elbow (2).

(5) Install condensing tank assembly (Refer to para 4.20).

4.22 Pressure / Temperature Potentiometers Adjustments

EQUIPMENT ALERT
The pressure zero, pressure range, and temperature potentiometers cannot be adjusted separately. If one potentiometer needs adjusted, then the entire potentiometer adjustment procedure must be performed, and it must be performed in the proper sequence as follows:

(1) Remove right hand side panel.

(2) Open sterilizer door.

DANGER
The following steps require the sterilizer to be plugged in to power while the adjustment is being performed. Do not touch any components except for the adjusting screw of the potentiometer. Failure to comply with these instructions could result in an electrical shock, which could result in severe personal injury or death.

NOTE
After the following step is performed, the display PC board lamps will individually illuminate and then extinguish one at a time in a left to right sequence. When all the lamps have illuminated and extinguished, proceed with step 4.

(3) Press and hold down the LIQUIDS and PACKS buttons simultaneously while connecting the power cord to the sterilizer (See Figure 4-25). Release the LIQUIDS and PACKS buttons.

NOTE
When each button is pressed, its corresponding lamp will illuminate and stay illuminated. Also, after the following step, the PRESSURE (KPA) display will display the pressure that the control PC board is reading and the TEMP (°C) / TIME (MIN: SECONDS) display will display the temperature that the control PC board is reading. When each button has been pushed, proceed with step 5.

(4) Press and release the UNWRAPPED, POUCHES, LIQUIDS, PACKS, START, STOP, AND ON/STANDBY buttons one at a time and in this order.

(5) Turn adjusting screw of pressure zero potentiometer (1, Figure 4-26) in the counterclockwise direction until the PRESSURE (KPA) display reads 0.0 kPa (0.0 psi).

(6) Turn adjusting screw of pressure zero potentiometer (1) in the clockwise direction until the PRESSURE (PSI) display reads 1 kPa (0.1 psi).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE

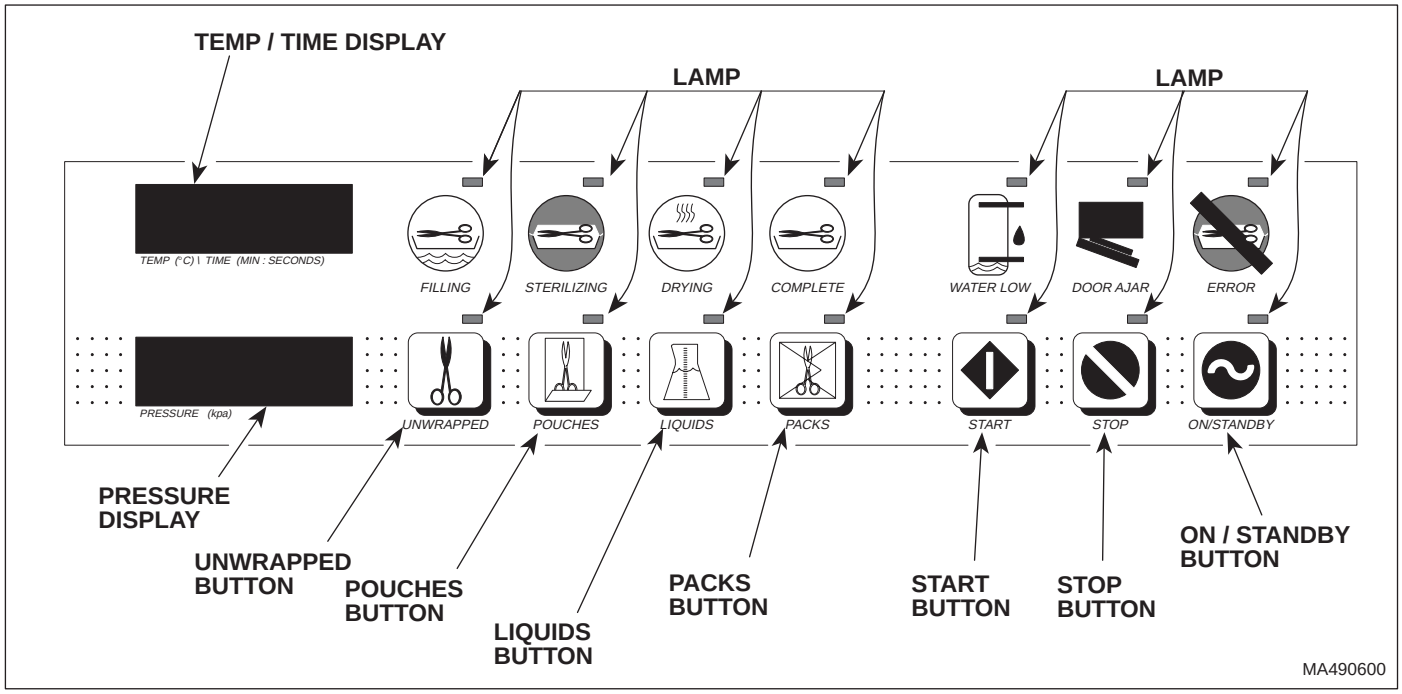


Figure 4-25. Display PC Board Lamp / Display / Button Check

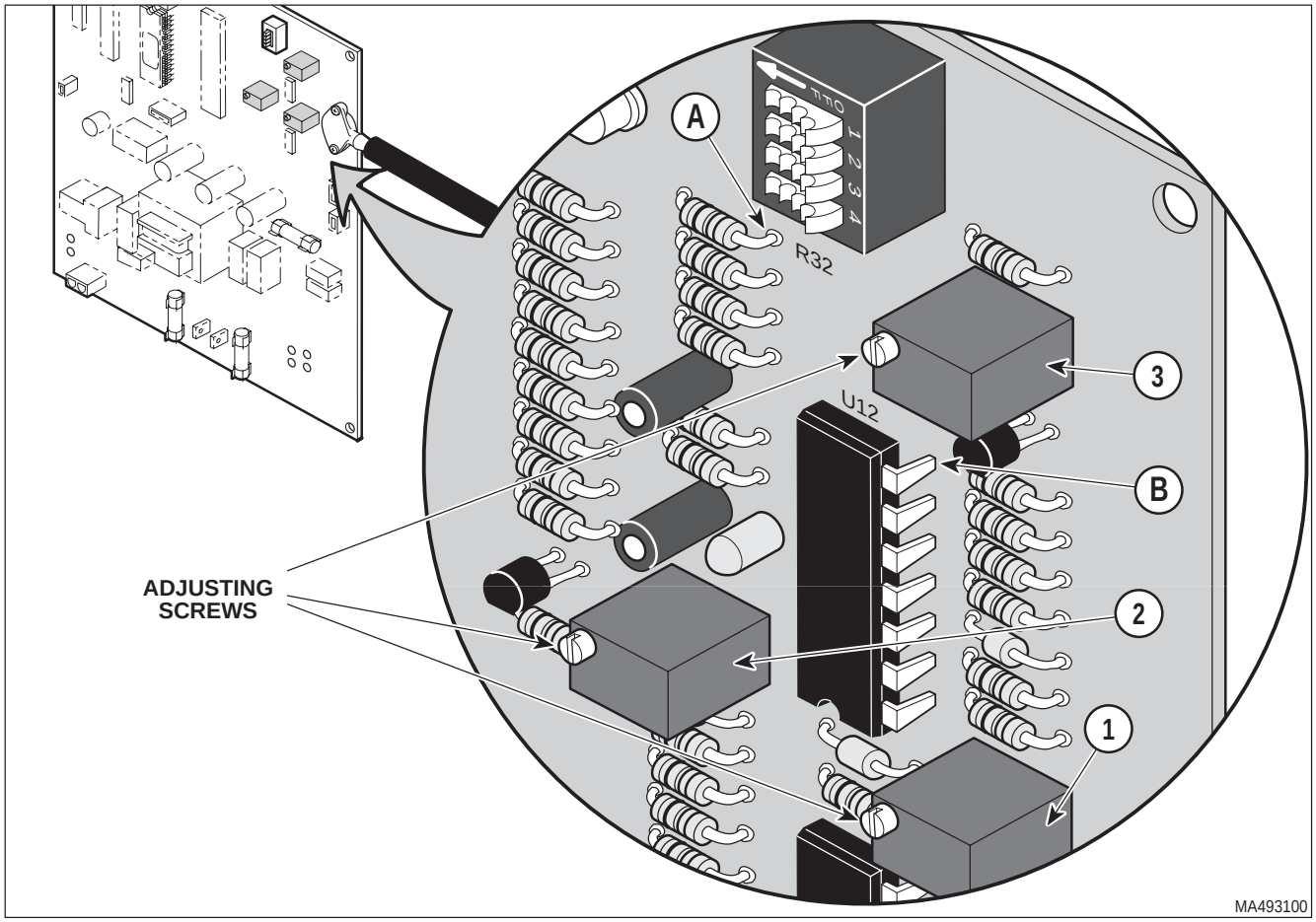


Figure 4-26. Potentiometer Adjustments

CAUTION
The multimeter leads must be connected exactly as shown in the illustration. Connecting a lead to the wrong side of the resistor or wrong pin of the chip will result in an incorrect adjustment.

(7) Set the multimeter to read VDC in at least the 5 Volts range. Connect the red lead of a multimeter to Test Point (A) and the black lead of a multimeter to Test Point (B).

NOTE
In the following step, if the digital multimeter being used has only three digits, adjust to a reading of 2.54 VDC and then adjust and set to where the reading just changes to 2.55 VDC.

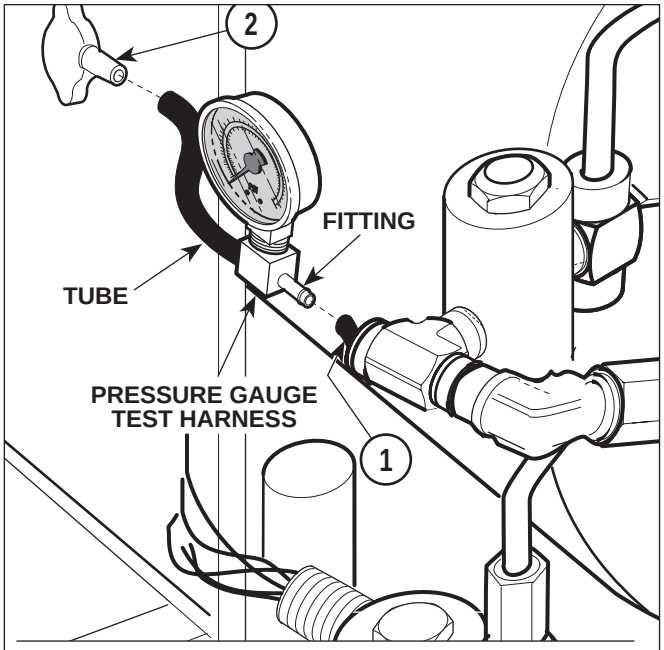
(8) The multimeter should read 2.550 VDC ±0.001 VDC. If multimeter reading is not 2.550 VDC ±0.001 VDC, adjust the adjusting screw of the temperature potentiometer (3) in a clockwise direction to lower the voltage setting or a counter-clockwise direction to raise the voltage setting until the multimeter reading is 2.550 VDC ±0.001 VDC.

(9) Close the sterilizer door.

(10) Connect Pressure Gauge Test Harness to sterilizer (See Figure 4-27) (Refer to the sterilizer Service and Parts Manual for this special tool).

(11) Press the START button to start a test/calibration cycle and wait until the temperature on the TEMP (°C) / TIME (MIN: SECONDS) display reaches 133-134°C (272 - 273°F) (See Figure 4-25).

NOTE
Turning the adjusting screw of the pressure range potentiometer in the clockwise direction raises the sterilizer pressure reading while turning the adjusting screw in the counter-clockwise direction lowers the sterilizer pressure reading.



To connect Pressure Gauge Test Harness to sterilizer:

1. **Disconnect tube (1) from pressure sensor (2).**
2. **Connect tube of Pressure Gauge Test Harness to pressure sensor (2).**
3. **Connect tube (1) to fitting of Pressure Gauge Test Harness.**

To disconnect Pressure Gauge Test Harness from sterilizer:

1. **Disconnect tube (1) from fitting of Pressure Gauge Test Harness.**
2. **Disconnect tube of Pressure Gauge Test Harness from pressure sensor (2).**
3. **Connect tube (1) to pressure sensor (2).**

MA490800

Figure 4-27. Connecting / Disconnecting Pressure Gauge Test Harness

(12) Turn the adjusting screw of the pressure range potentiometer (2, Figure 4-26) in the clockwise or counter-clockwise direction until the reading on the PRESSURE (KPA) display matches the reading of the Pressure Gauge Test Harness within a tolerance of ±3.5 kPa (0.5 psi).

(13) Recheck the multimeter reading. It should still read 2.550 VDC ±0.001 VDC.

(14) Press the STOP button to end the test/calibration cycle and allow the sterilizer to vent (See Figure 4-25).

(15) Disconnect the leads of the multimeter from Test Points (A and B, Figure 4-26).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(16) Disconnect the power cord from the sterilizer and then repeat steps 3 and 4 of this procedure. The reading should read 1 kPa (0.1 psi) with the sterilizer door open. If not, repeat steps 5 and 6 of this procedure.

(17) Disconnect the power cord from sterilizer.

(18) Disconnect Pressure Gauge Test Harness from sterilizer (See Figure 4-27).

(19) Install right hand side panel.

4.23 Display PC Board Lamp / Display / Button Check

(1) Disconnect power cord from the sterilizer.

(2) Press and hold down the LIQUIDS and PACKS buttons simultaneously, while connecting the power cord to the sterilizer (See Figure 4-28). Release the LIQUIDS and PACKS buttons.

(3) Observe the display PC board lamps. In a left to right sequence, each lamp on the display PC board should individually illuminate and then extinguish. If all the display PC board lamps do not illuminate and then extinguish, replace display PC board (Refer to para 4.19).

(4) Press and release the UNWRAPPED, POUCHES, LIQUIDS, PACKS, START, STOP, AND ON/STANDBY buttons one at a time and in this order.

(5) Observe the lamps that correspond with each button. If all lamps do not illuminate and stay illuminated when their corresponding button is pressed, replace the display PC board (Refer to para 4.19).

(6) Observe the pressure and temperature/time displays. If the pressure and temperature/time displays do not display pressure and temperature readings, replace the display PC board (Refer to para 4.19).

(7) Disconnect power cord from the sterilizer.

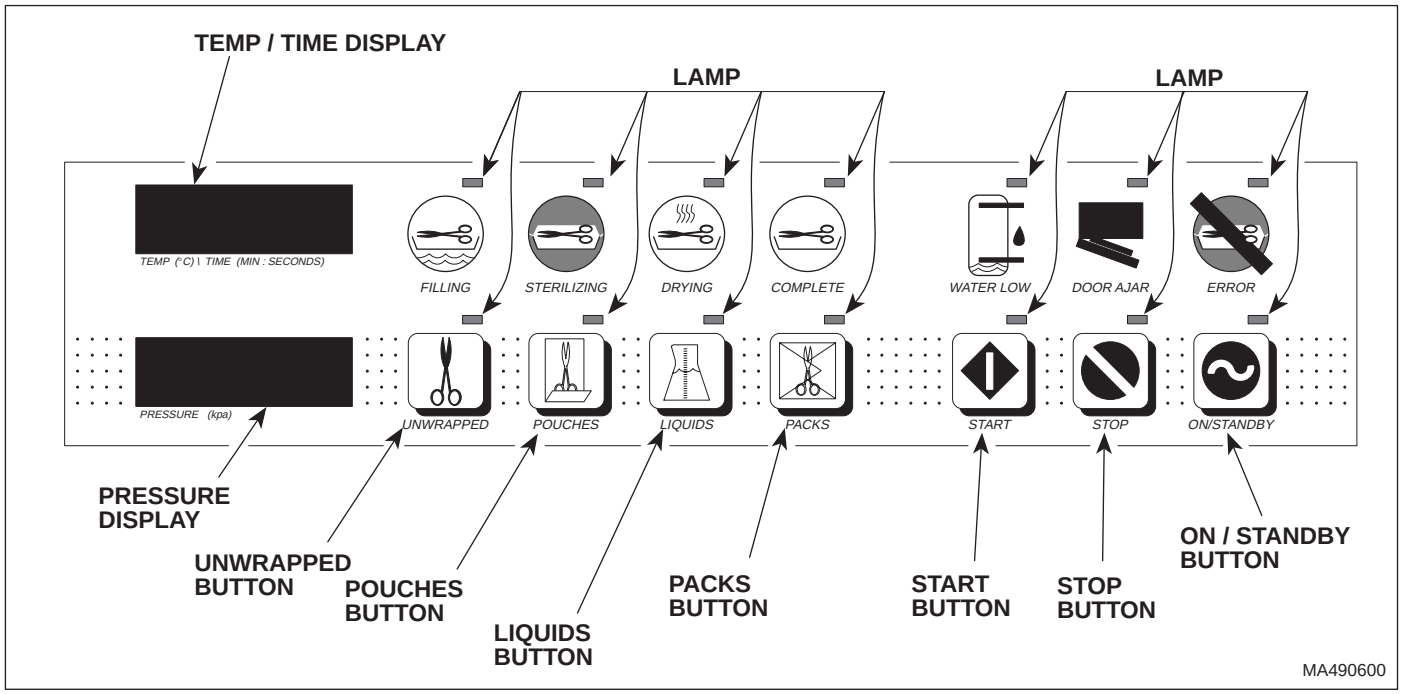


Figure 4-28. Display PC Board Lamp / Display / Button Check

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

4.24 Pressure Relief Valve Check

(1) Remove the top inspection cover (1, Figure 4-29).

WARNING
Refer to the operator manual for complete instructions on operating the sterilizer. Failure to do so could result in severe personal injury.

(2) Select the UNWRAPPED cycle and start the cycle.

DANGER
Pressure Relief Valve will be hot. Use a screwdriver or rod to pull the wire ring. Do not pull the wire ring with bare hands or burns will result. Steam will be vented from under the rear of the sterilizer. To keep from being burned, place a steam barrier (a rolled up towel) around the bottom of the sterilizer.

(3) When the "heat up" portion of the cycle is complete and the elapsed time is being counted down on the display PC board, pull on wire ring of pressure relief valve (2) with a screwdriver.

(4) If excessive force was required to open pressure relief valve (2), replace the pressure relief valve (Refer to para 4.21).

NOTE
If the pressure relief valve does not close completely when the wire ring is released, pull the wire ring again and release it quickly so the valve snaps back into position. Do this until the valve seats properly.

(5) Release wire ring of pressure relief valve (2). The steam should vent out of the pressure relief valve until the wire ring is released. When the wire ring is released, the valve should seat, stopping the release of steam.

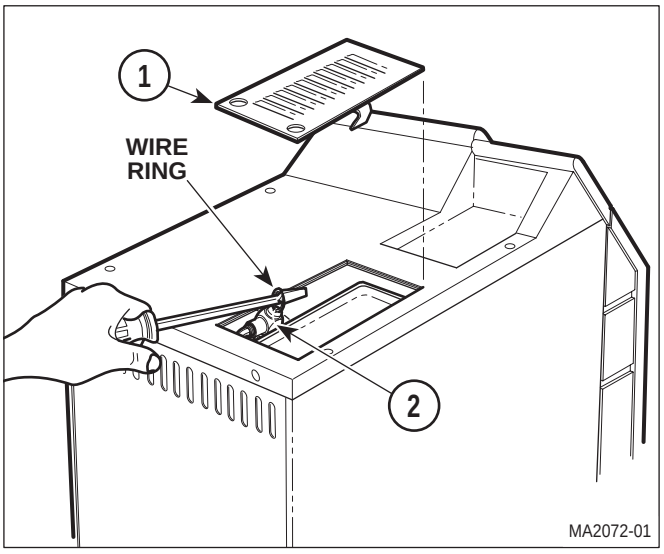


Figure 4-29. Pressure Relief Valve Check

(6) If the pressure relief valve (2) will not re-seat properly, replace the pressure relief valve (Refer to para 4.21).

(7) Install top inspection cover (1).

4.25 Dry Cycle Dip Switches Adjustment

(1) Unplug power cord from outlet receptacle.

(2) Remove right hand side panel (Refer to para 4.3).

NOTE
There are four element duration dip switch settings; setting #1, setting #2, setting #3, and setting #4. The unit comes factory set at the element duration setting #3. Setting #1 is shortest element duration (coolest), setting #2 is longer, setting #3 is longer yet, and setting #4 is the longest element duration (hottest.

(3) If unit has been overheating during the drying cycle and activating the overheat thermostat, determine the current element duration dip switch settings for the unit per Figure 4-30 and then change the dip switch settings to the next shortest element duration.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(4) Run a cycle. Repeat step 3 if overheat thermostat activates again.

(5) Install right hand side panel (Refer to para 4.3).

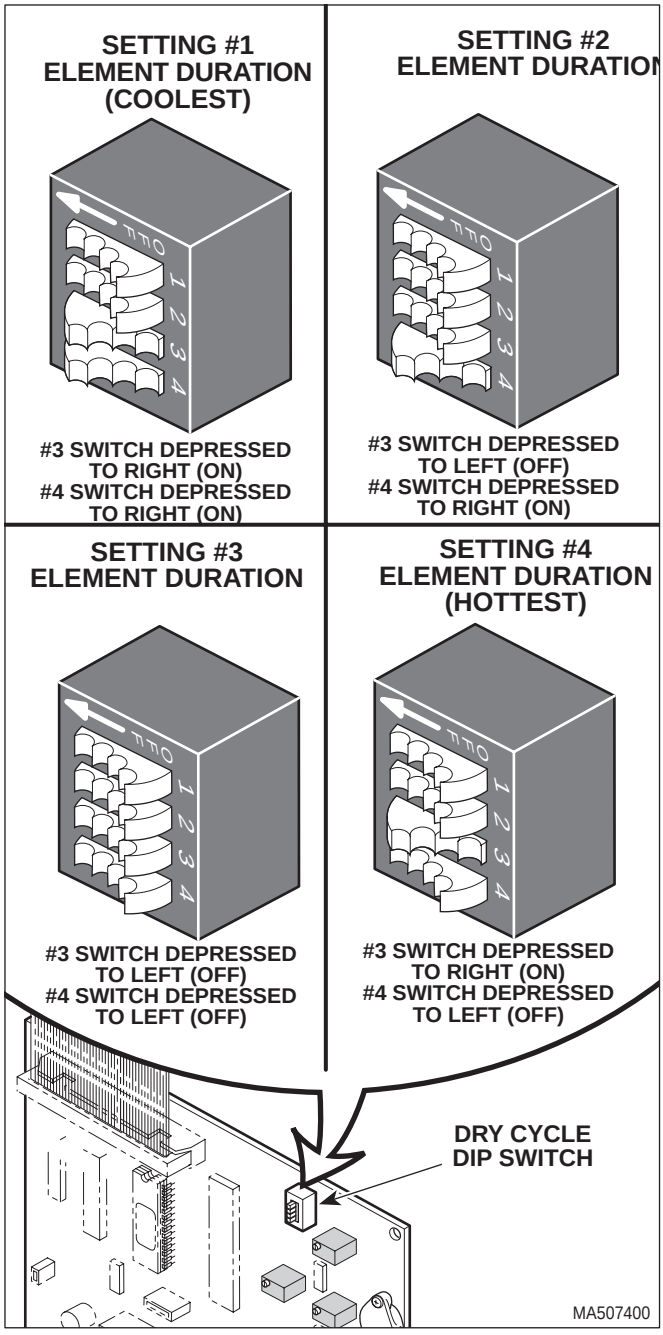


Figure 4-30. Dry Cycle Dip Switches Adjustment

4.26 HEPA Filter Removal / Installation

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove top cover (Refer to para 4.2).

(3) Cut two cable ties (1, Figure 4-31) securing two tubes (2) to HEPA filter (3); then disconnect two tubes (2) from HEPA filter (3).

B. Installation

(1) Connect two tubes (2) to HEPA filter (3), making sure flow arrow (A) on HEPA filter is pointing away from air compressor as shown.

(2) Secure tubes (2) with cable ties (1).

(3) Install top cover (Refer to para 4.2).

(4) Plug power cord into outlet receptacle.

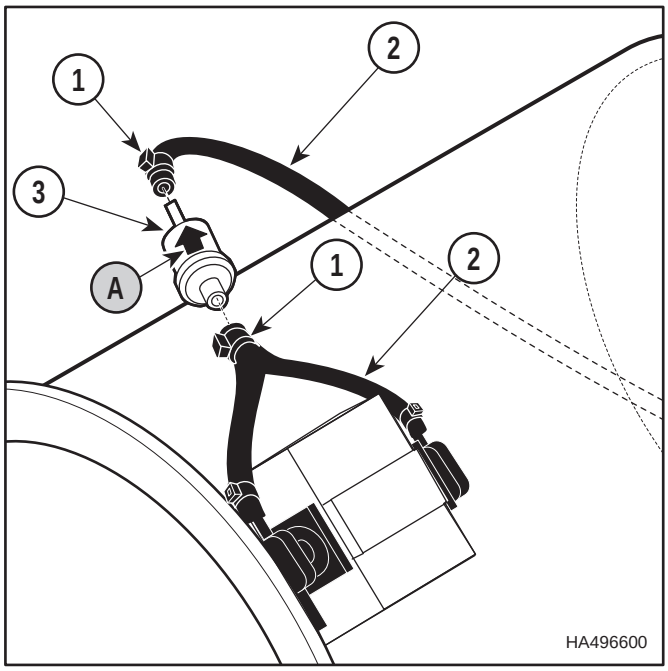


Figure 4-31. HEPA Filter Removal / Installation

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

4.27 Air Compressor Removal / Installation

A. Removal

(1) Remove top cover (Refer to para 4.2).

(2) Remove right hand side cover (Refer to para 4.3).

(3) Tag and disconnect two wires (1, Figure 4-32) from two air compressor wires (2).

(4) Remove screw (3), ground wire (4), and starwasher (5) from chamber housing (6).

(5) Cut two cable ties (7) and then remove two tubes (8) from outlet ports (A) of air compressor (9).

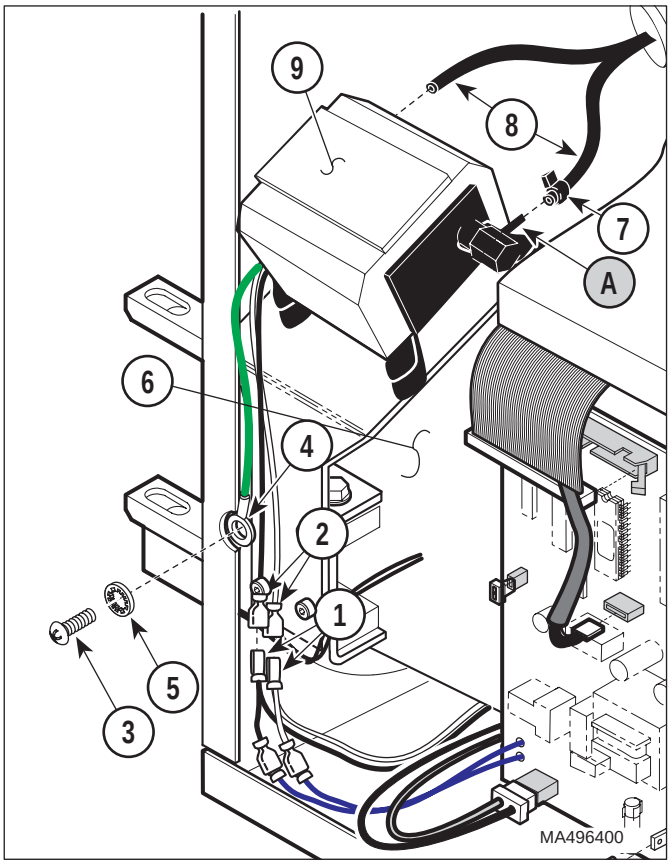


Figure 4-32. Air Compressor Disconnection / Connection

(6) Remove four screws (1, Figure 4-33), locknuts (2), lockwashers (3), and air compressor assembly (4) from chamber housing (5).

(7) Remove four screws (6), locknuts (7), and air compressor (8) from compressor mounting bracket (9).

B. Installation

(1) Install air compressor (8, Figure 4-33) on compressor mounting bracket (9) and secure with four screws (6) and locknuts (7).

(2) Install air compressor assembly (4) on chamber housing (5) and secure with four lockwashers (3), locknuts (2), and screws (1).

(3) Connect two tubes (8, Figure 4-32) to two outlet ports (A) of air compressor (9).

(4) Secure two tubes (8) in place with a cable tie (7).

(5) Attach ground wire (4) to chamber housing (6) and secure with screw (3) and starwasher (5).

(6) Connect two wires (1) to two air compressor wires (2).

(7) Install right hand side cover (Refer to para 4.3).

(8) Install top cover (Refer to para 4.2).

4.28 Dry Air Inlet Solenoid Valve Removal / Installation

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove right hand side panel (Refer to para 4.3).

(3) Remove back panel (Refer to para 4.5).

(4) Remove control PC board (Refer to para 4.12).

(5) Tag and disconnect two wires (1, Figure 4-34) from terminals (2).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

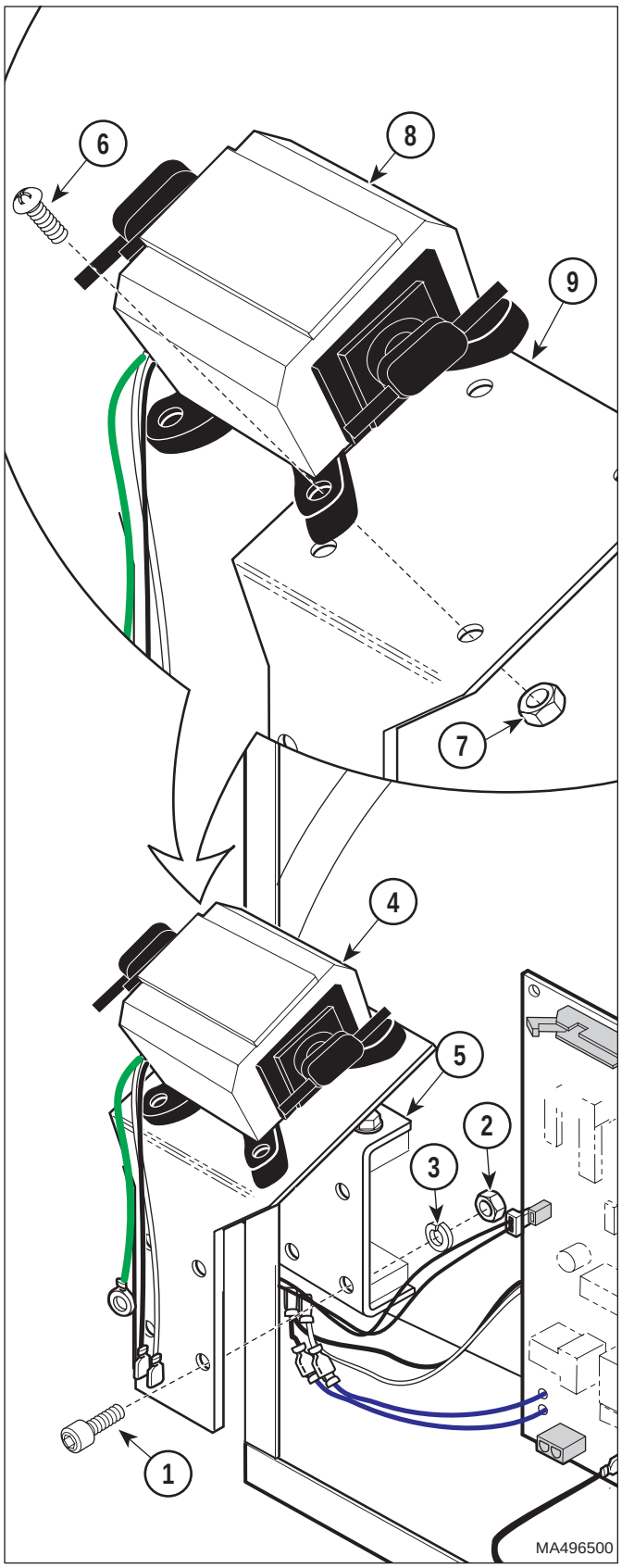


Figure 4-33. Air Compressor Removal / Installation

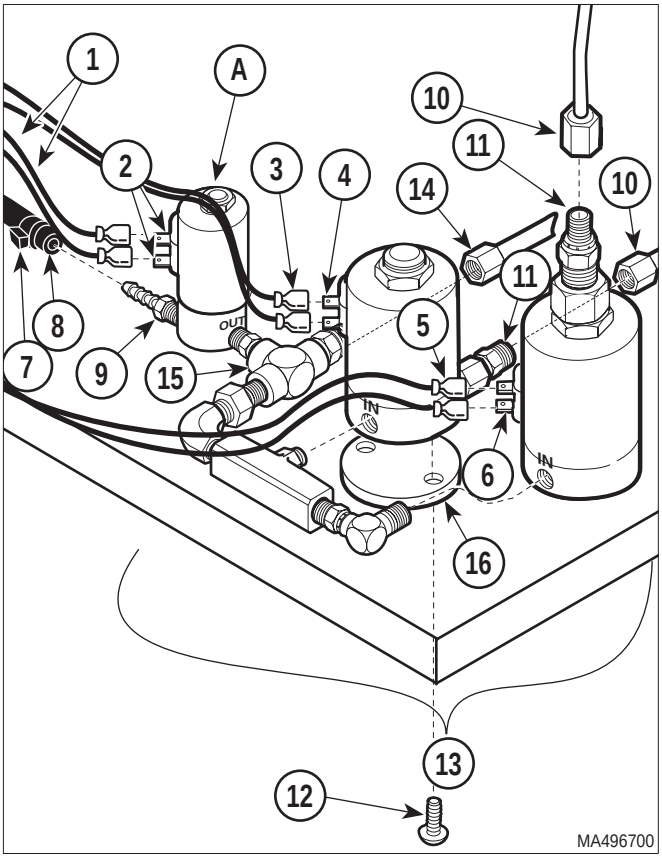


Figure 4-34. Dry Air Inlet Solenoid Valve Removal / Installation

(6) Tag and disconnect two wires (3) from terminals (4).

(7) Tag and disconnect two wires (5) from terminals (6).

(8) Cut cable tie (7) and disconnect tube (8) from male barb fitting (9).

(9) Disconnect two tubes (10) from fittings (11).

(10) Remove two screws (12) securing manifold assembly (13) in place.

(11) Disconnect tube (14) from fitting (15).

(12) Remove manifold assembly (13) and spacer (16) from sterilizer.

(13) Remove male barb fitting (1, Figure 4-35) from dry air inlet solenoid valve (2).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

(14) Remove manifold assembly (3) from dry air inlet solenoid valve (2).

B. Installation

NOTE
Do not coat last two threads of male tee or male barb fitting. Doing so may allow contaminants to enter the system. Also, only coat threads which will mate with solenoid valve - do not coat compression threads.

(1) Coat threads of manifold assembly (3, Figure 4-35) and male barb fitting (1) which will be installed on solenoid valve with teflon tape or hydraulic sealant.

(2) Install manifold assembly (3) in the "IN" port and male barb fitting (1) in the "OUT" port of dry air inlet solenoid valve (2).

(3) Position spacer (16, Figure 4-34) and manifold assembly (13) in sterilizer.

(4) Connect two tubes (10) to fittings (11).

(5) Connect tube (14) to tee (15).

(6) Secure manifold assembly (13) in place with two screws (12), making sure spacer (16) is in place.

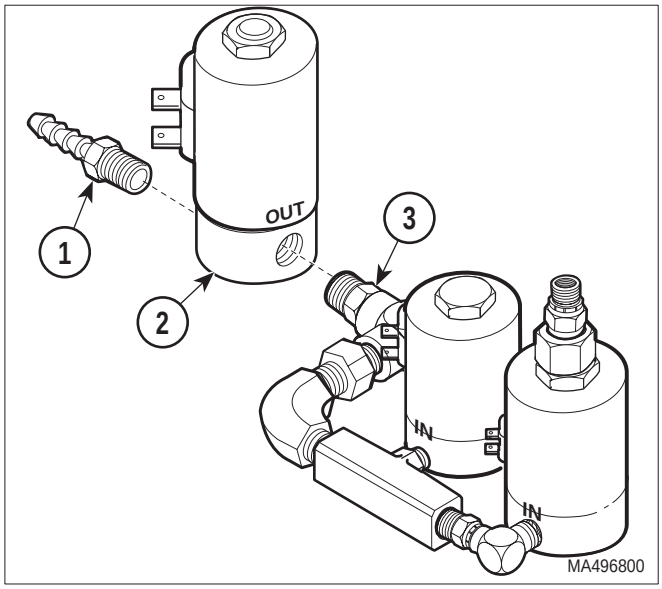


Figure 4-35. Fittings Removal / Installation

(7) Connect tube (8) to male barb fitting (9) and secure with a cable tie (7).

(8) Loosen nut (A); then position terminals (2) so wires (1) may be properly connected. Tighten nut (A).

(9) Connect two wires (1) to terminals (2).

(10) Connect two wires (3) to terminals (4).

(11) Connect two wires (5) to terminals (6).

(12) Install control PC Board (Refer to para 4.12).

(13) Install back panel (Refer to para 4.5).

(14) Install right hand side panel (Refer to para 4.3).

(15) Plug power cord into outlet receptacle.

4.29 Dry Air Outlet Solenoid Valve Removal / Installation

A. Removal

(1) Unplug power cord from outlet receptacle.

(2) Remove right hand side panel (Refer to para 4.3).

(3) Remove back panel (Refer to para 4.5).

(4) Tag and disconnect two wires (1, Figure 4-36) from terminals of dry air outlet solenoid valve (2).

(5) Cut cable tie (3) and remove tube (4) from male barb fitting (5).

(6) Disconnect three tubes (6) from fittings (7).

(7) Remove tee assembly (1, Figure 4-37) and male tee (2) from dry air outlet solenoid valve (3).

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

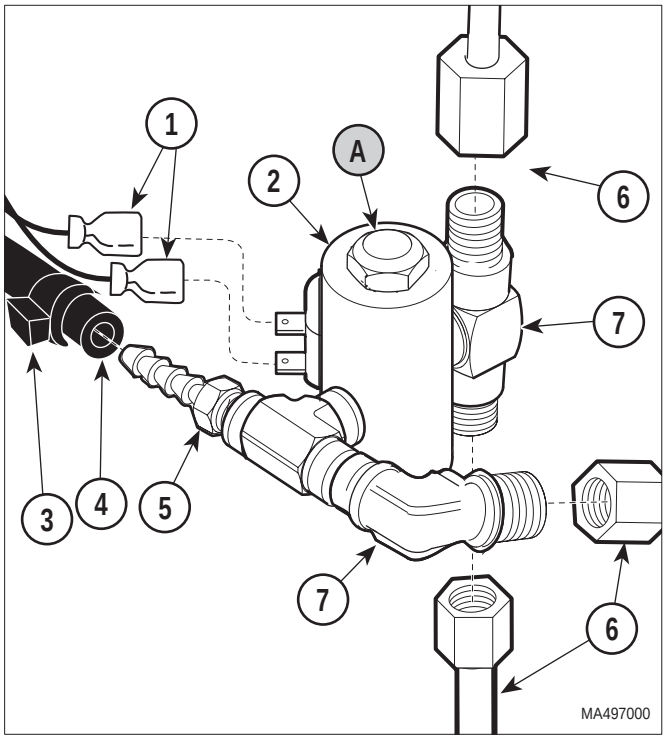


Figure 4-36. Dry Air Outlet Solenoid Valve Removal / Installation

B. Installation

NOTE
Do not coat last two threads of tee assembly (1) or male tee (2). Doing so may allow contaminants to enter the system. Also, only coat threads which will mate with solenoid valve - do not coat compression threads.

(1) Coat threads of tee assembly (1, Figure 4-37) and male tee (2) which will be screwed in dry air outlet solenoid valve (3) with teflon tape or hydraulic sealant.

(2) Install tee assembly (1) in the "IN" port and male tee (2) in the "OUT" port of dry air outlet solenoid valve (3).

(3) Connect three tubes (6, Figure 4-36) to fittings (7).

(4) Connect tube (4) on male barb fitting (5) and secure with a cable tie (3).

(5) Loosen nut (A); then position terminals of dry air inlet solenoid valve (2) so wires (1) may be properly connected. Tighten nut (A).

(6) Connect two wires (1) to terminals of dry air outlet solenoid valve (2).

(7) Install back panel (Refer to para 4.5).

(8) Install right hand side panel (Refer to para 4.3).

(9) Plug power cord into outlet receptacle.

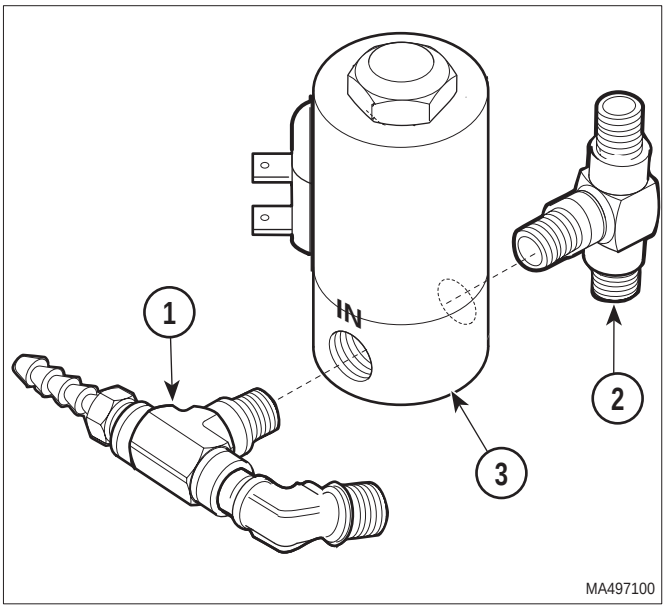


Figure 4-37. Fittings Removal / Installation

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

5.1 Wiring Diagram

Figure 5-1 illustrates the wiring connections for the sterilizer.

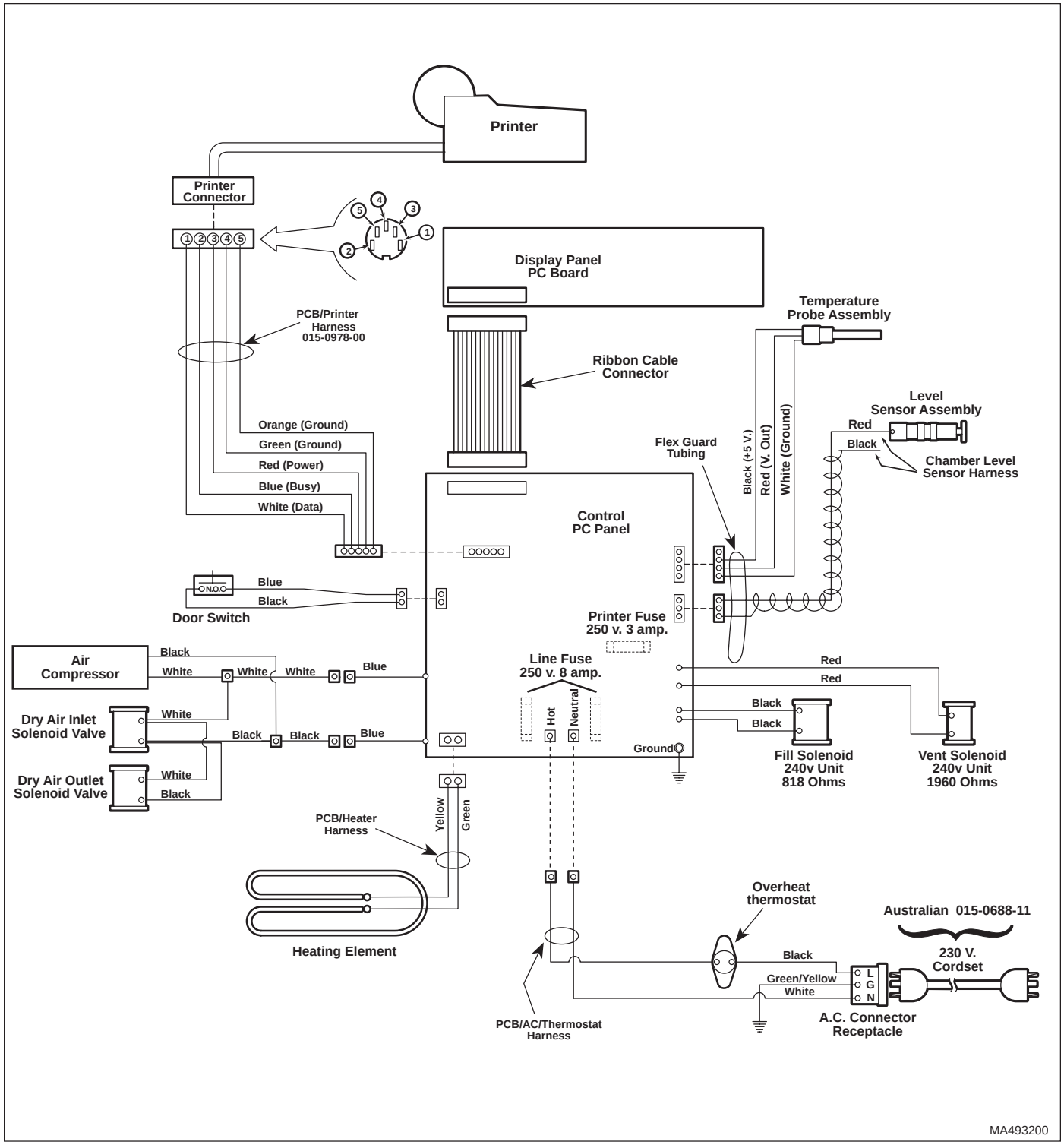


Figure 5-1. Wiring Diagram (Applies To Serial Numbers TFN1000 Thru Present)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

5.2 Flow Diagram

Figure 5-2 illustrates the water, heated water, steam, vented steam/water, and filtered air flow throughout the sterilizer during a cycle.

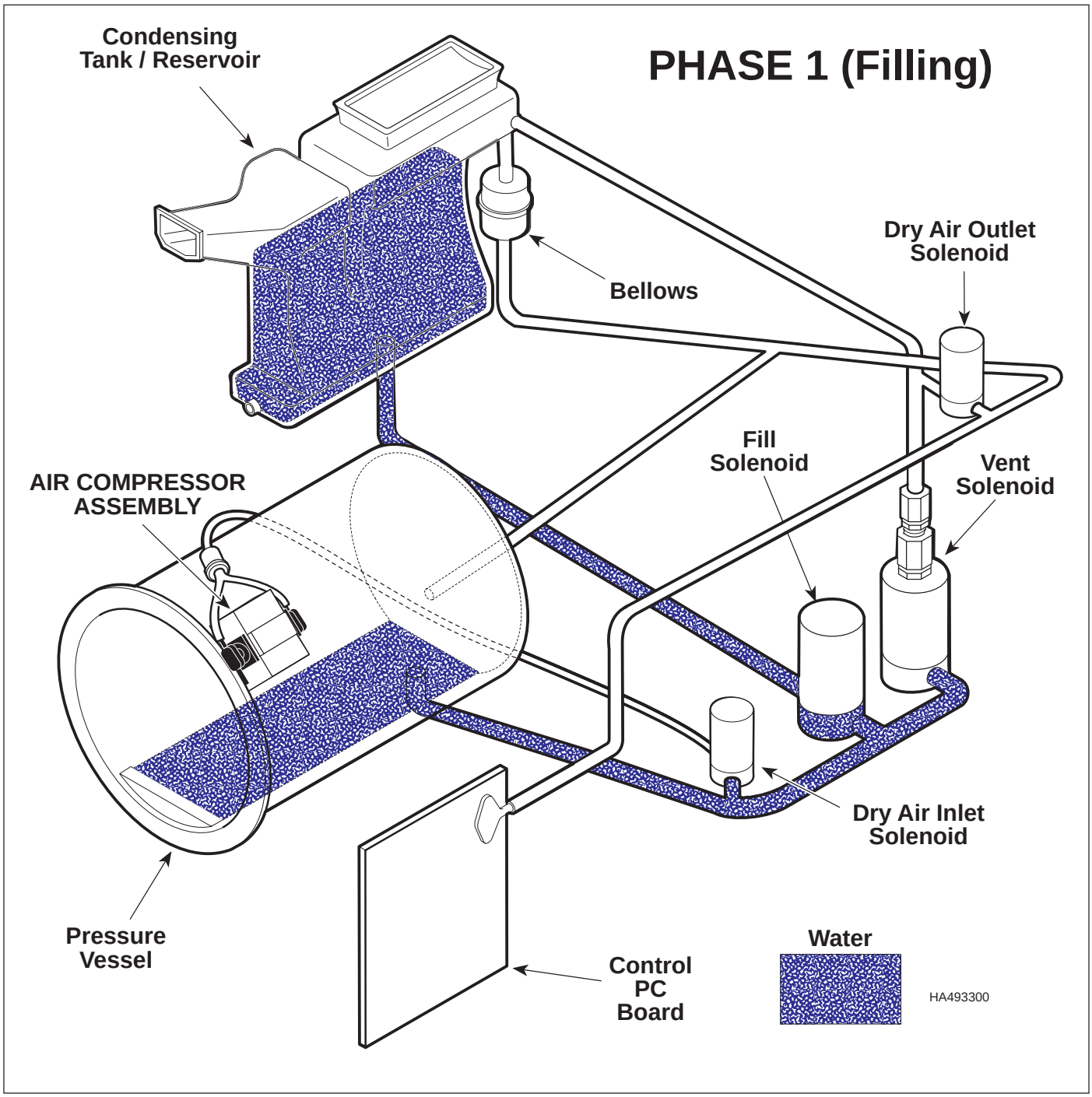


Figure 5-2. Flow Diagram (Sheet 1 of 5)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

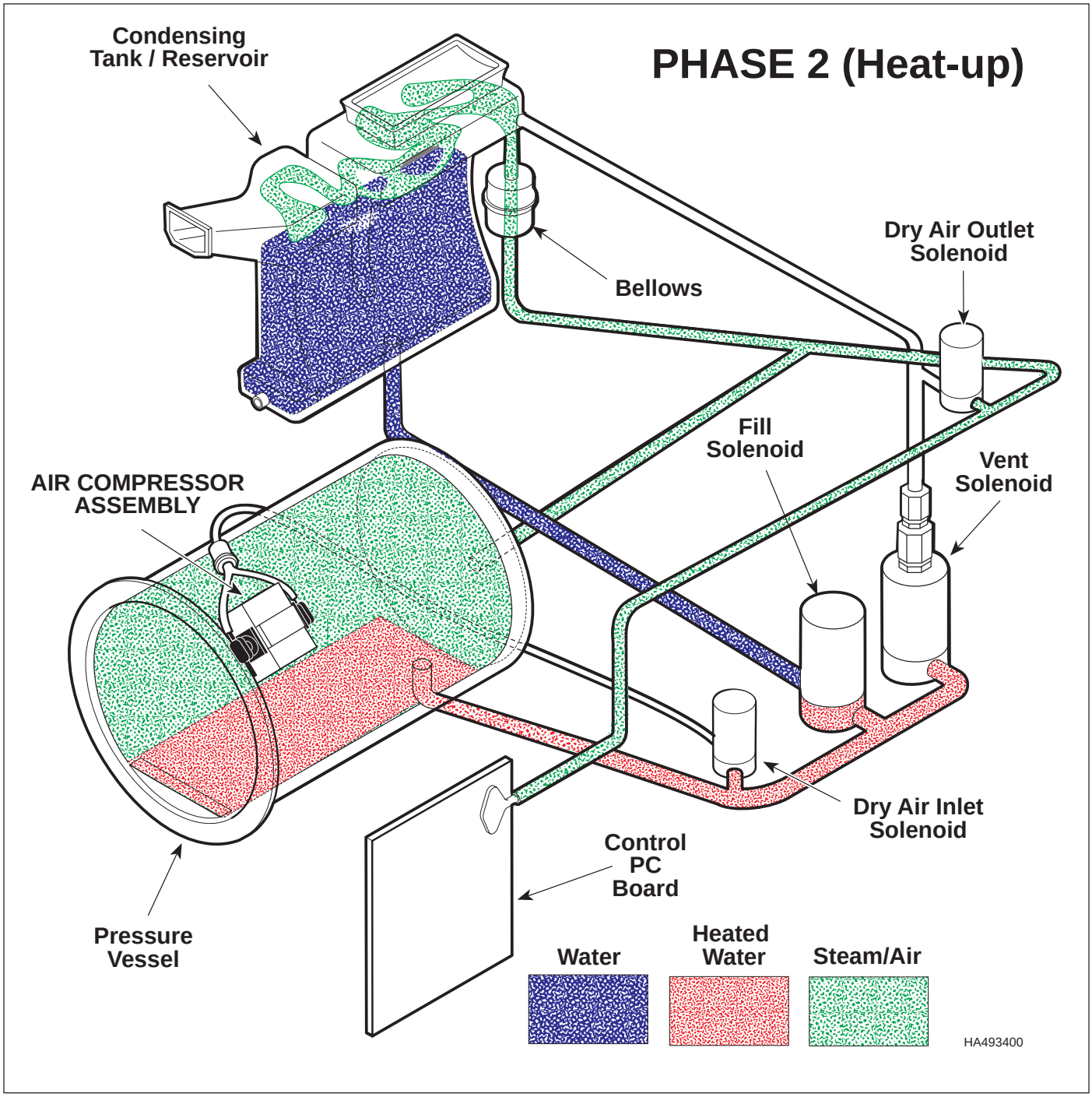


Figure 5-2. Flow Diagram (Sheet 2 of 5)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

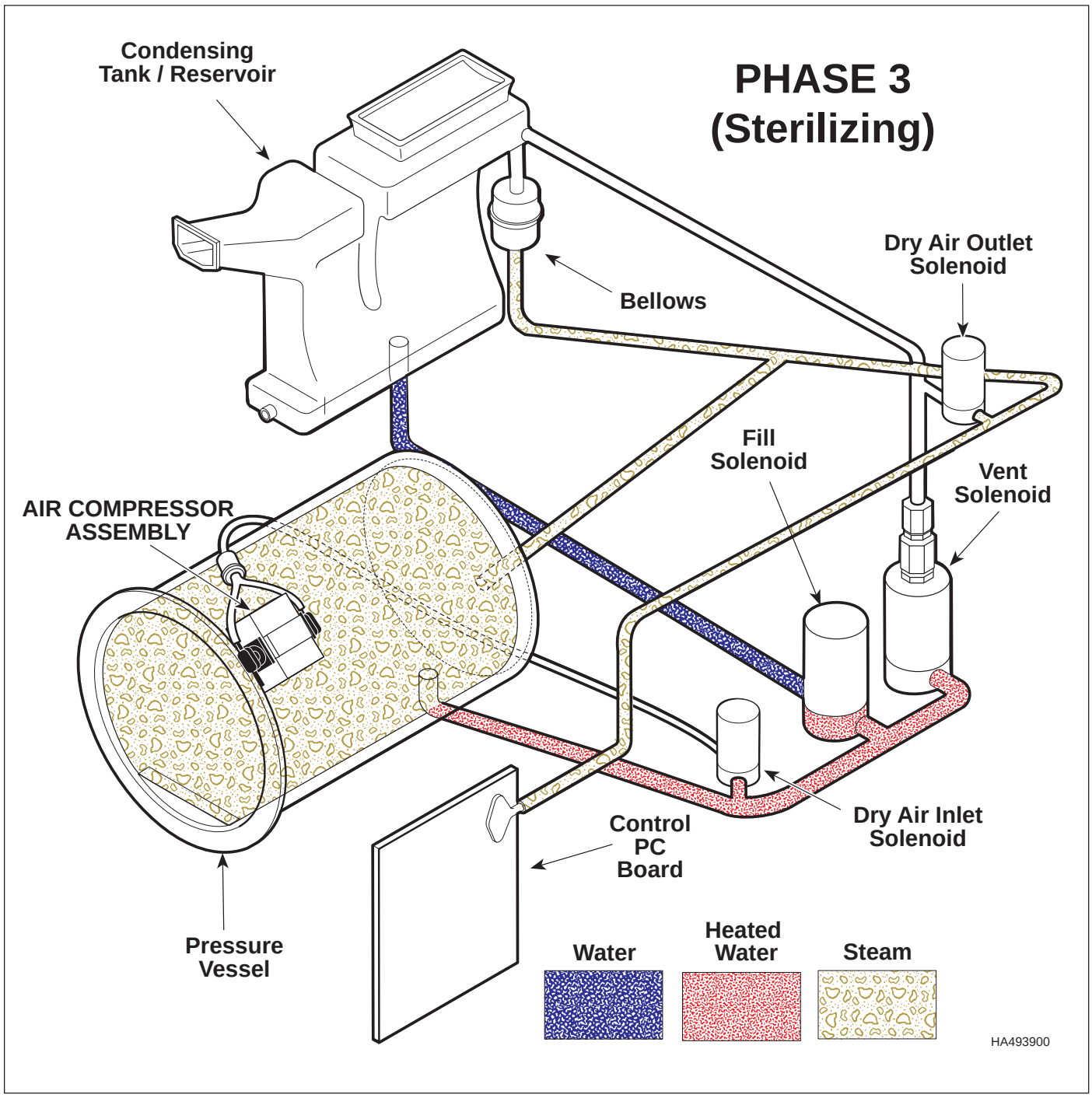


Figure 5-2. Flow Diagram (Sheet 3 of 5)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

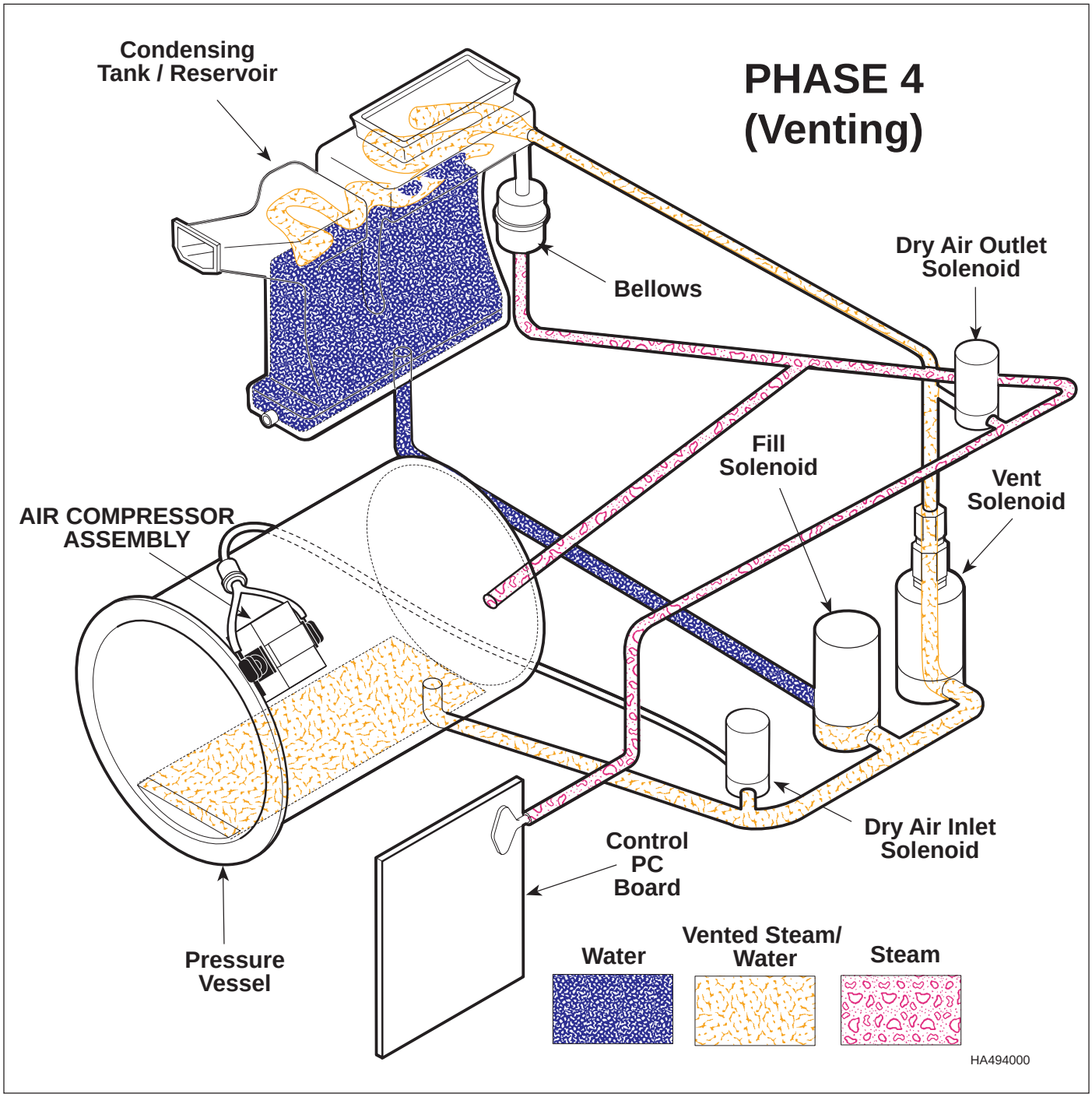


Figure 5-2. Flow Diagram (Sheet 4 of 5)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

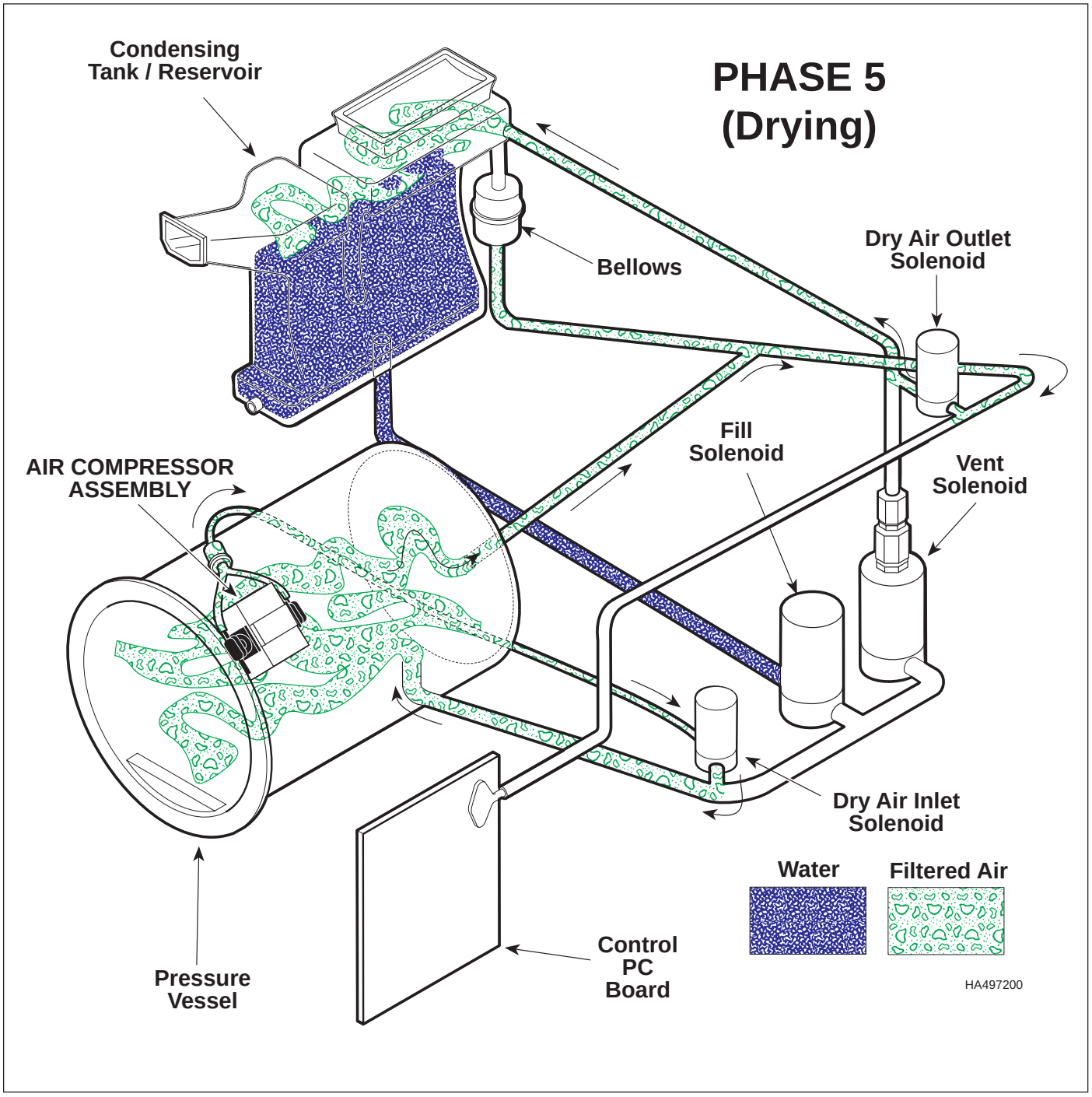


Figure 5-2. Flow Diagram (Sheet 5 of 5)

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

5.3 Pressure / Temperature Chart

Table 5-1 is a chart which lists what pressure should be present at particular temperature.

Table 5-1. Pressure / Temperature Chart

KPA (PSI)	°C	°F	KPA (PSI)	°C	°F
0 (0)	100.0	212.0	2.3 (16)	122.0	251.6
0.1 (1)	101.9	215.4	2.5 (17)	123.0	253.4
0.3 (2)	103.6	218.5	2.6 (18)	124.1	255.4
0.4 (3)	105.3	221.5	2.8 (19)	125.0	257.0
0.6 (4)	106.9	224.4	2.9 (20)	126.0	258.8
0.7 (5)	108.4	227.1	3.0 (21)	126.9	260.0
0.9 (6)	109.8	229.6	3.1 (22)	127.8	262.0
1.0 (7)	11.3	232.3	3.3 (23)	128.7	263.7
1.2 (8)	112.6	234.7	3.5 (24)	129.6	265.3
1.3 (9)	113.9	237.0	3.6 (25)	130.4	266.7
1.5 (10)	115.2	239.4	3.8 (26)	131.3	268.3
1.6 (11)	116.4	241.5	3.9 (27)	132.1	269.8
1.74 (12)	117.6	243.7	4.0 (28)	132.9	271.2
1.9 (13)	118.8	245.8	4.2 (29)	133.7	272.7
2.0 (14)	119.9	247.8	4.4 (30)	134.5	274.1
2.2 (15)	121.0	249.8			

Normal steam sterilizing range is 124°C to 135°C (255°F to 275°F).

Figures in chart are for steam pressure only. The presence of any air in the autoclave invalidates temperature readings.

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

SECTION VI
PARTS LIST

6.1 Introduction

The illustrated parts list provides information for identifying and ordering the parts necessary to maintain the sterilizer in peak operating condition. Refer to paragraph 1.5 for parts ordering information.

The parts list also illustrates disassembly and assembly relationships of parts.

6.2 Description of Columns

The *Item* column of the parts list gives a component its own unique number. The same number is given to the component in the parts illustration. This allows a part number of a component to be found if the technician can visually spot the part on the illustration. The technician simply finds the component in question on the illustration and notes the item number of that component. Then, he finds that item number in the parts list. The row corresponding to the item number gives the technician the part number, a description of the component, and quantity of parts per subassembly. Also, if a part number is known, the location of that component can be determined by looking for the item number of the component on the illustration.

The *Part No.* column lists the MIDMARK part number for that component.

The *Description* column provides a physical description of the component.

The *Qty.* column lists the number of units of a particular component that is required for the subassembly. The letters “AR” denote “as required” when quantities of a particular component cannot be determined, such as: adhesive.

Bullets [•] in the *Part No.* column and the *Description* column show the indenture level of a component. If a component does not have a bullet, it is a main component of that illustration. If a component has a bullet, it is a subcomponent of the next component listed higher in the parts list than itself that does not have a bullet. Likewise, if a component has two bullets, it is a subcomponent of the next component listed higher in the parts list than itself that has only one bullet.

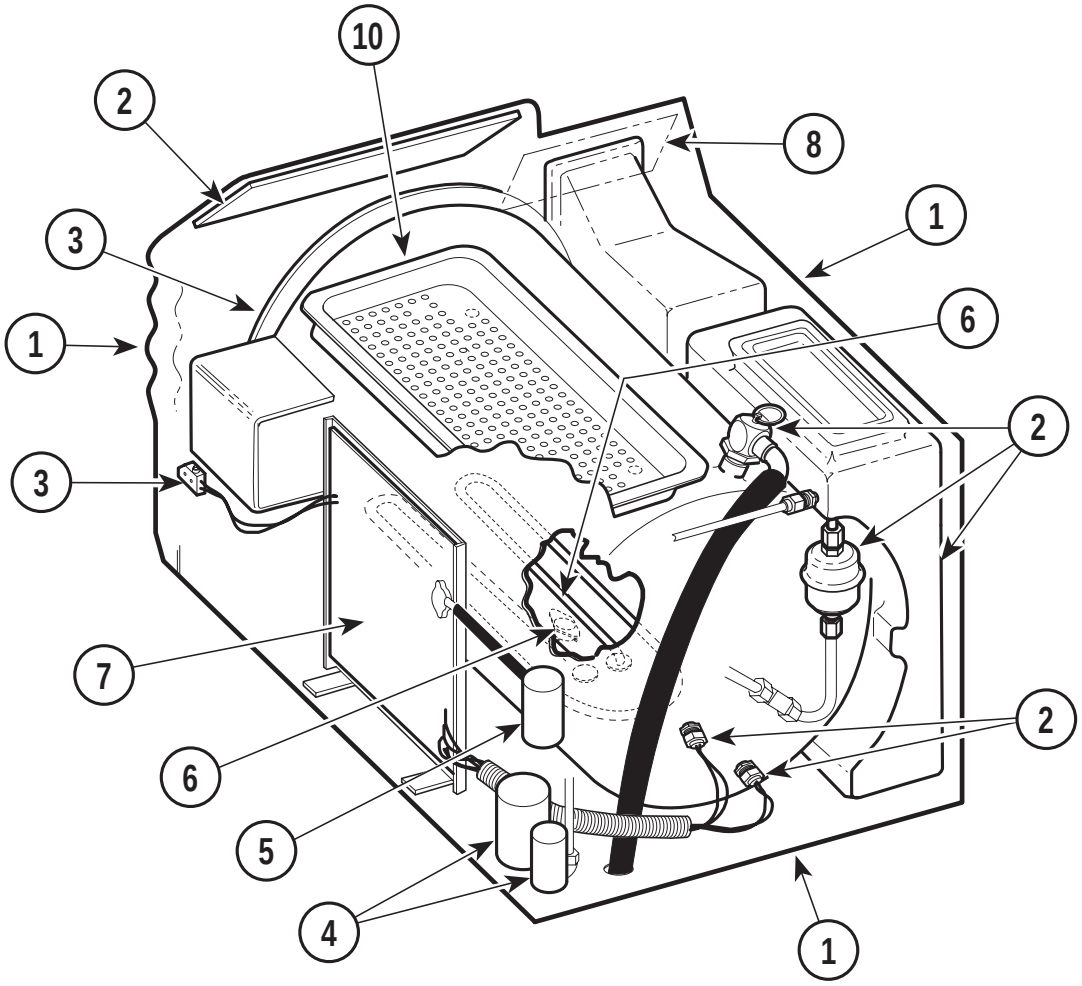
6.3 Torque Specifications and Important Assembly Notes

When specific assembly torque specifications, measurements, or procedures have been identified, by our engineering department, as required to assure proper function of the unit, those torque specifications, measurements, and procedures will be noted on the parts illustrations. Adherence to these requirements is essential.

© Midmark 1998 SF-1573 Rev. 5/95

Printed in U.S.A.

Pictorial Index



MA225400

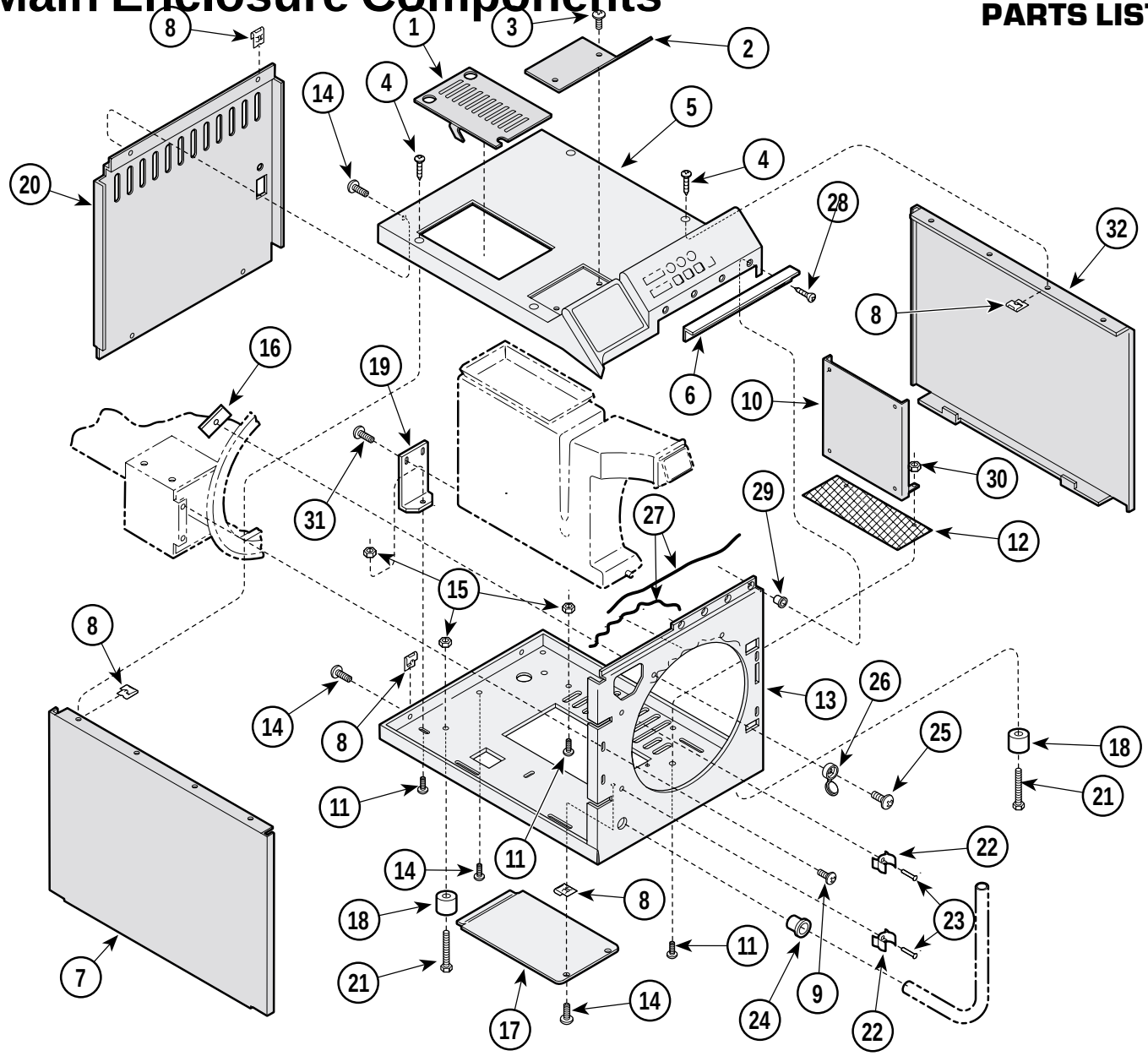
Item	Model No.	Description	Page
	M9A-001	Midmark M9A Ultraclave (240 VAC [Serial Number Prefix "TFN"])	6-2
1		Main Enclosure Components	6-3
2		Plumbing & Sensor Components	6-4
3		Pressure Vessel Components	6-5
4		Manifold Assembly	6-6
5		Dry Solenoid Manifold Assembly	6-7
6		Electrical Components	6-8
7		Control PC Board	6-9
8		Labels and Decals	6-10
9		Printer Components	6-11
10		Racks, Trays and Cleaner	6-12
11		Packaging	6-13

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Main Enclosure Components



MA445301

Used on units with Serial Number TFN-1000 thru TFN-1469

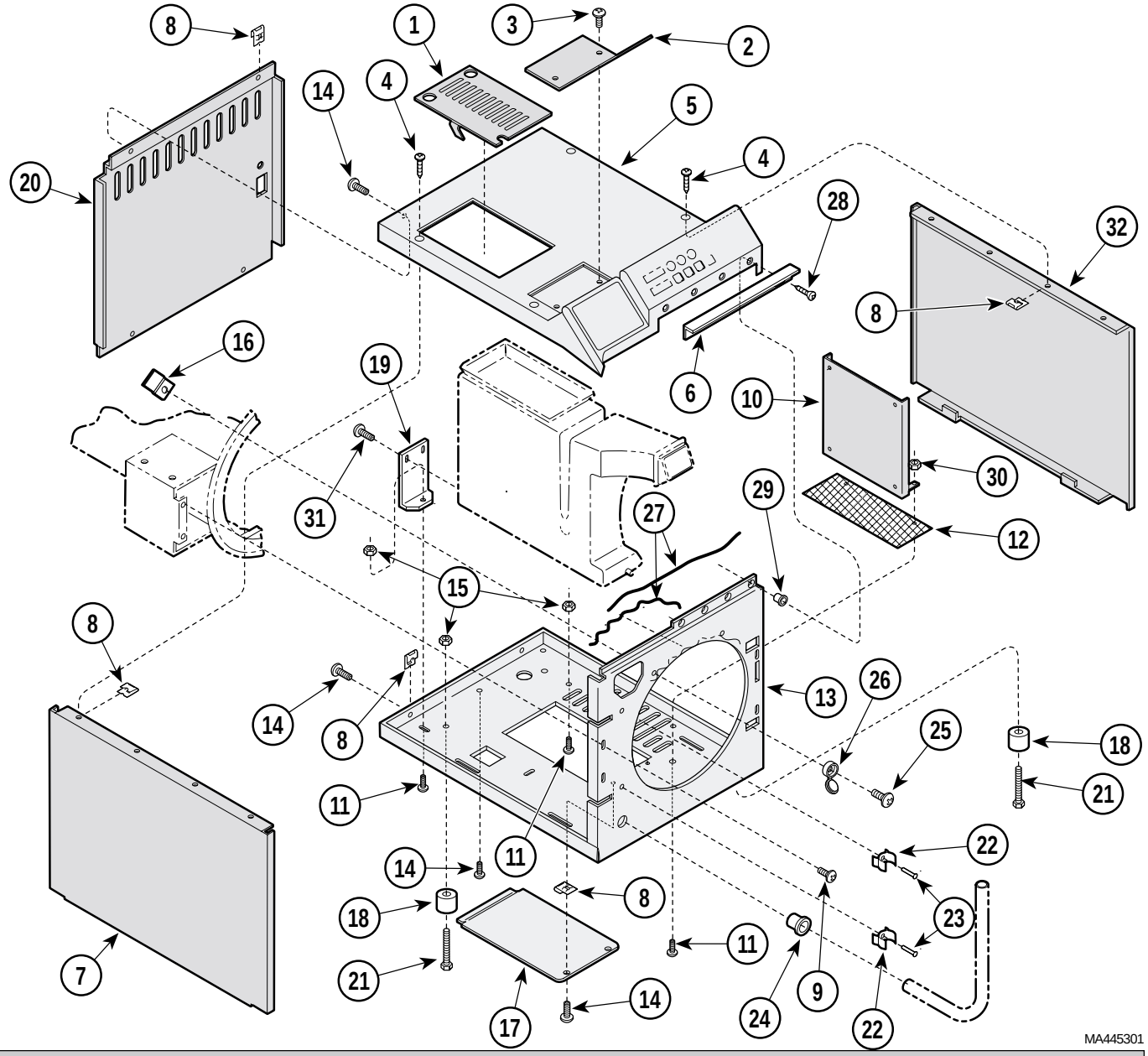
Item	Part No.	Description	Qty.
1	030-1117-00	Top Inspection Cover	1
2	050-1775-00	Cover Plate - Printer	1
3	040-0008-50	Screw	2
4	040-0010-88	Screw	4
5	002-0356-01	Top Cover	1
6	050-2034-00	Top Cover Steam Block	1
7	050-1767-00	L. H. Side Panel	1
8	H352623	Tinnerman Clip	10
9	040-0010-95	Screw	5
10	050-3996-00	Control PCB Bracket	1
11	040-0010-75	Screw	4
12	016-0428-04	Screen	1
13	050-4325-01	Base	1
14	040-0010-125	Screw	5
15	041-0010-02	Nut	5
16	030-1025-00	Flange Clamp	2
17	050-4326-01	Base Inspection Cover	1
18	016-0523-01	Leveler Foot	4
19	050-1778-00	Bracket	1
20	050-3831-00	Back Panel	1
21	040-0010-44	Screw	4
22	053-0388-01	Hose Clip	2
23	042-0010-21	Pop Rivet	2
24	053-0068-11	Strain Relief Bushing	1
25	040-0010-124	Screw	2
26	053-0723-00	Screw Cover	2
27	042-0021-00	Adhesive	AR
28	040-0010-133	Screw	2
29	042-0045-16	Nutsert	2
30	041-0010-04	Nut	3
31	040-0010-74	Screw (Apply Loctite #042-0024-00)	1
32	050-3998-00	R. H. Side Panel	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 10/99

Printed in U.S.A.

Main Enclosure Components



Used on units with Serial Number TFN-1470 thru Present

Item	Part No.	Description	Qty.
1	030-1117-00	Top Inspection Cover	1
2	050-1775-00	Cover Plate - Printer	1
3	040-0008-50	Screw	2
4	040-0010-88	Screw	4
5	002-0356-01	Top Cover	1
6	050-2034-00	Top Cover Steam Block	1
7	050-4571-10	L. H. Side Panel	1
8	H352623	Tinnerman Clip	10
9	040-0010-95	Screw	5
10	050-3996-00	Control PCB Bracket	1
11	040-0010-75	Screw	4
12	016-0428-04	Screen	1
13	050-4325-01	Base	1
14	040-0010-125	Screw	5
15	041-0010-02	Nut	5
16	030-1025-00	0550-4750-00	050-4326-01 Base Inspection Cover 1

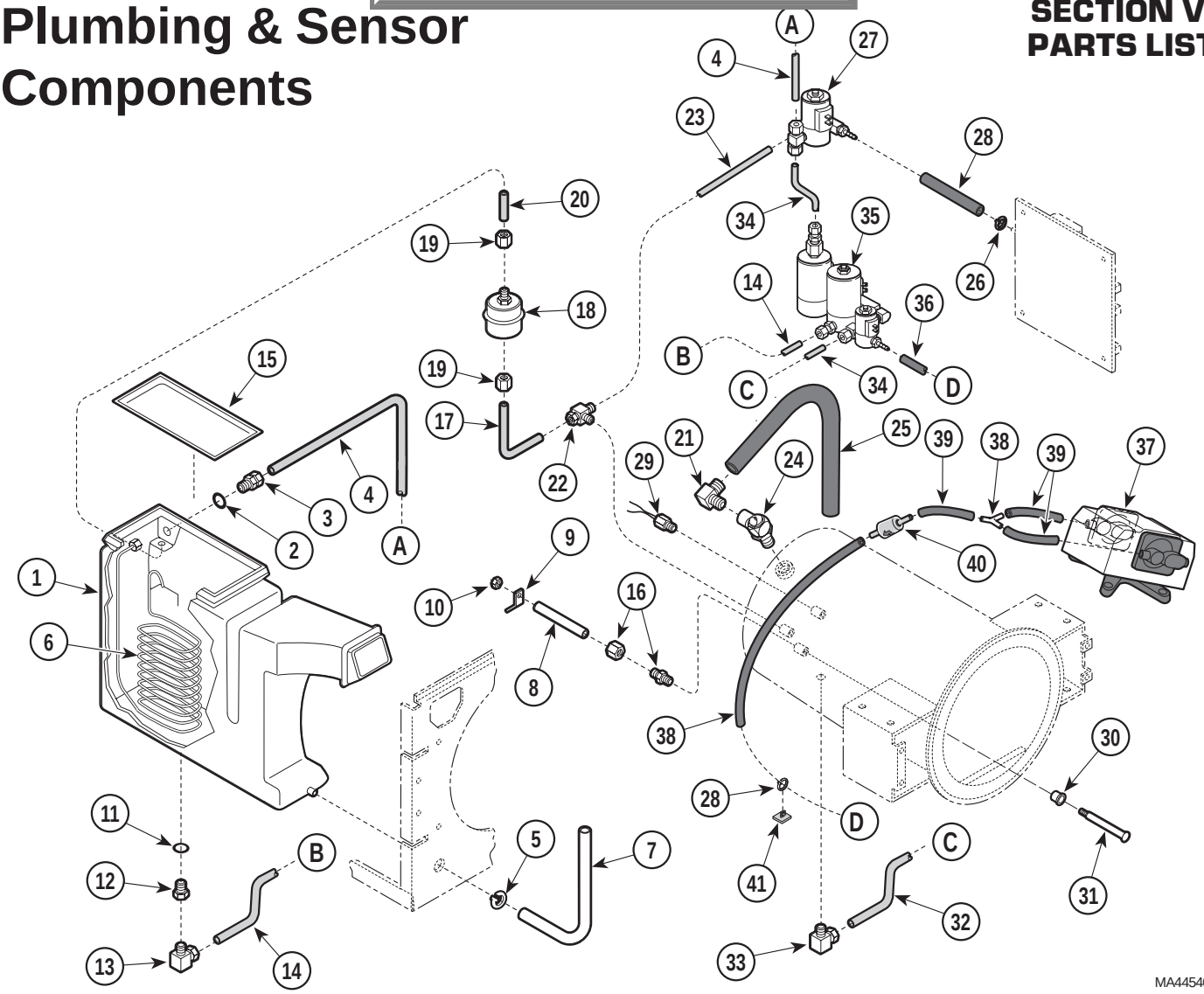
Item	Part No.	Description	Qty.
18	016-0523-01	Leveler Foot	4
19	050-1778-00	Bracket	1
20	050-3831-00	Back Panel	1
21	040-0010-44	Screw	4
22	053-0388-01	Hose Clip	2
23	042-0010-21	Pop Rivet	2
24	053-0068-11	Strain Relief Bushing	1
25	040-0010-124	Screw	2
26	053-0723-00	Screw Cover	2
27	042-0021-00	Adhesive	AR
28	040-0010-133	Screw	2
29	042-0045-16	Nutsert	2
30	041-0010-04	Nut	3
31	040-0010-74	Screw (Apply Loctite #042-0024-00)	1
32	050-4570-10	R. H. Side Panel	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 3/00

Printed in U.S.A.

Plumbing & Sensor Components



MA445401

Used on units with Serial Number TFN-1000 thru TFN-1110

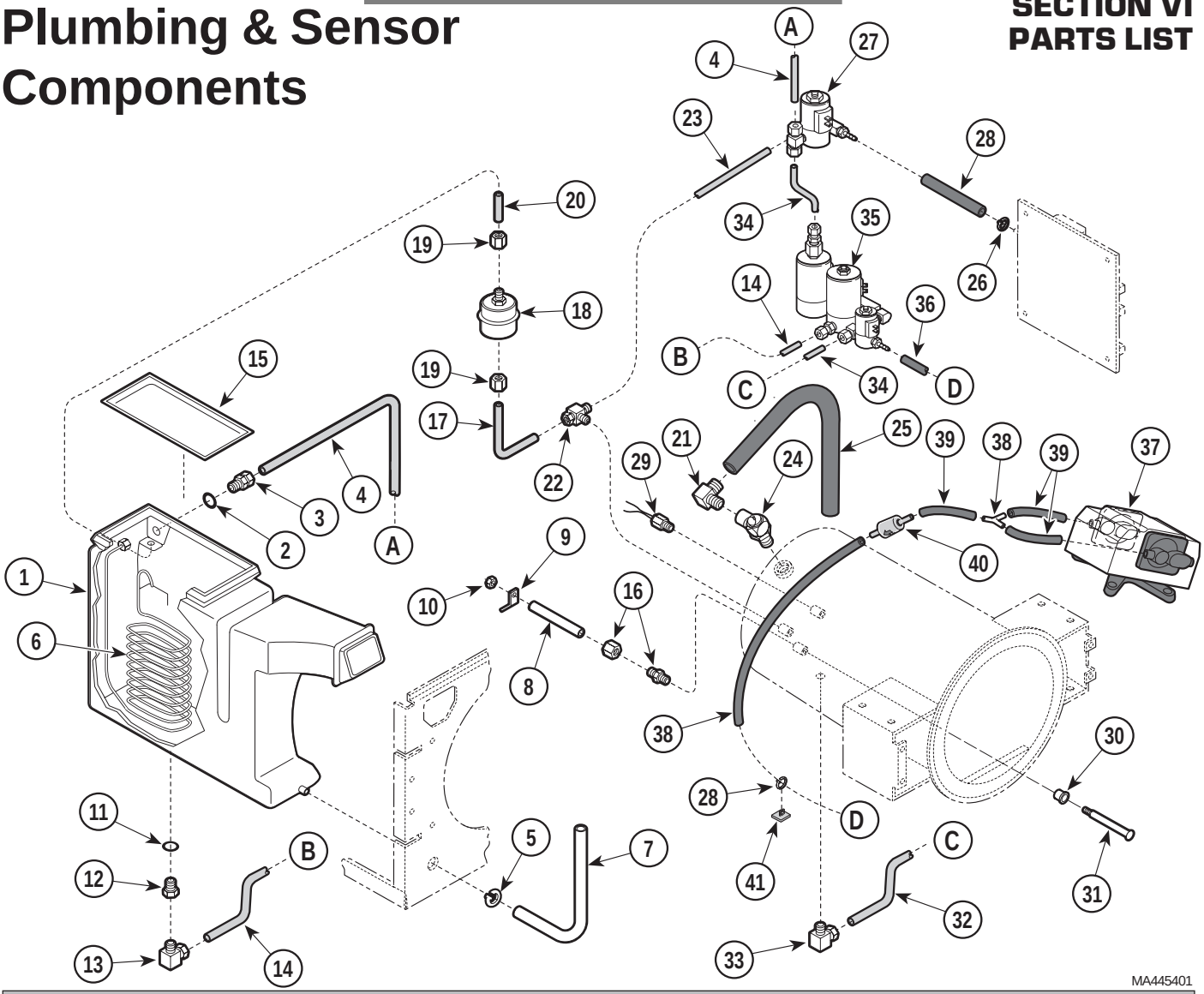
Item	Part No.	Description	Qty.
1	053-0614-00	Condensing Tank	1
2	H98137	Gasket	1
3	014-0216-00	Bulkhead Union	1
4	014-0297-00	Tube	1
5	016-0748-00	Hose Clip	1
6	052-0173-00	Condensing Coil	1
7	053-0391-01	Hose	1
8	002-0358-00	Lever Sensor Tube (Includes Item 9,10,16,30, and 31)	1
9	015-0595-00	Terminal	1
10	041-0006-02	Locknut	1
11	053-0393-00	O-ring	1
12	014-0209-00	Bulkhead Couple	1
13	014-0184-01	Male Elbow	1
14	014-0298-00	Tube	1
15	053-0614-01	Condensing Tank Lid	1
16	014-0212-00	Connector	1
17	014-0206-00	Tube	1
18	002-0375-00	Bellows Assembly	1
19	014-0392-00	Compression Nut	2
20	014-0208-00	Tube (Apply Valve Lube #064-0002-00)	1
21	014-0258-00	Male Elbow	1
22	014-0202-00	Male Branch Tee	1
23	014-0295-00	Dry Solenoid Tube	1
24	002-0359-01	Pressure Relief Valve (40 P.S.I.) (Includes Elbow, Item 23)	1
25	053-0613-02	Tube - Pressure Relief	1
26	015-0013-05	Cable Tie	11
27		Solenoid Assembly (Refer to "Dry Solenoid Manifold Assembly" Elsewhere)	Ref
28	053-0404-03	Pressure Sensor Tube	1
29	002-0357-00	Temperature Probe Assembly	1
30	053-0407-00	Spacer	1
31	030-0858-00	Level Sensor Assembly	1
32	014-0303-00	Tube	1
33	014-0184-01	Male 90° Elbow	1
34	014-0296-00	Fill / Drying Tube	1
35		Manifold Assembly (Refer to "Manifold Assembly" Elsewhere)	Ref
36	053-0891-04	Dry Solenoid Tube	1
37	029-2167-00	Air Compressor Assembly	1
38	053-0891-03	Compressor Tube	3
39	014-0299-00	"Y" Fitting	1
40	002-0594-00	Hepa Filter Kit	1
41	053-0939-00	Wire Tie Clip	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 1/01

Printed in U.S.A.

Plumbing & Sensor Components



MA445401

Used on units with Serial Number TFN-1111 thru TFN-1259

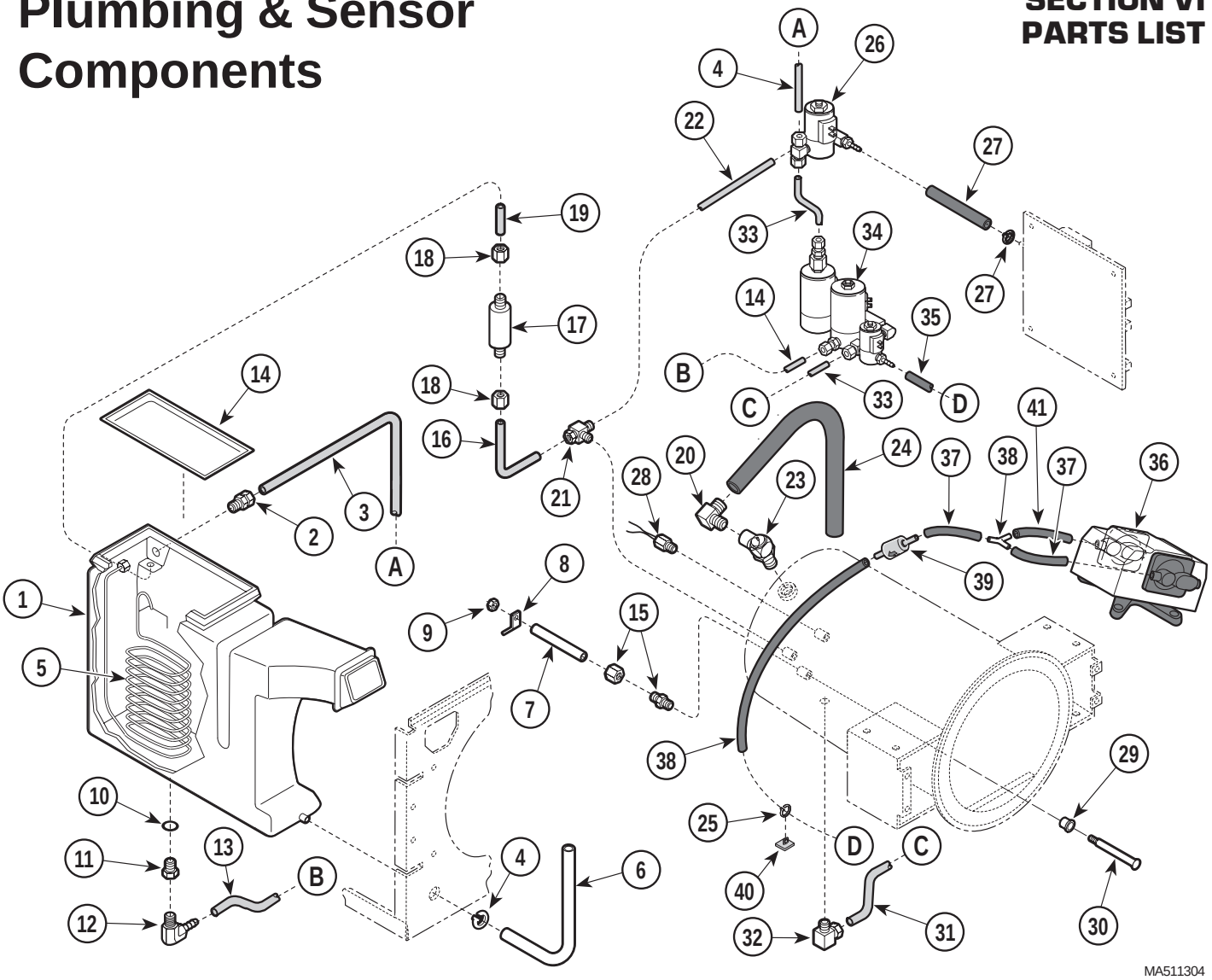
Item	Part No.	Description	Qty.
1	053-0966-00	Condensing Tank	1
2	H98137	Gasket	1
3	014-0216-00	Bulkhead Union	1
4	014-0297-00	Tube	1
5	016-0748-01	Hose Clip	1
6	052-0173-00	Condensing Coil	1
7	053-0391-01	Hose	1
8	002-0358-00	Lever Sensor Tube (Includes Item 9,10,16,30, and 31)	1
9	015-0595-00	Terminal	1
10	041-0006-02	Locknut	1
11	053-0393-00	O-ring	1
12	014-0209-00	Bulkhead Couple	1
13	014-0184-01	Male Elbow	1
14	014-0298-00	Tube	1
15	053-0966-01	Condensing Tank Lid	1
16	014-0212-00	Connector	1
17	014-0206-00	Tube	1
18	002-0375-00	Bellows Assembly	1
19	014-0392-00	Compression Nut	2
20	014-0208-00	Tube (Apply Valve Lube #064-0002-00)	1
21	014-0258-00	Male Elbow	1
22	014-0202-00	Male Branch Tee	1
23	014-0295-00	Dry Solenoid Tube	1
24	002-0359-01	Pressure Relief Valve (40 P.S.I.) (Includes Elbow, Item 23)	1
25	053-0613-02	Tube - Pressure Relief	1
26	015-0013-05	Cable Tie	11
27		Solenoid Assembly (Refer to "Dry Solenoid Manifold Assembly" Elsewhere)	Ref
28	053-0404-03	Pressure Sensor Tube	1
29	002-0357-00	Temperature Probe Assembly	1
30	053-0407-00	Spacer	1
31	030-0858-00	Level Sensor Assembly	1
32	014-0303-00	Tube	1
33	014-0184-01	Male 90° Elbow	1
34	014-0296-00	Fill / Drying Tube	1
35		Manifold Assembly (Refer to "Manifold Assembly" Elsewhere)	Ref
36	053-0891-04	Dry Solenoid Tube	1
38	029-2167-00	Air Compressor Assembly	1
39	053-0891-03	Compressor Tube	3
40	014-0299-00	"Y" Fitting	1
41	002-0594-00	Hepa Filter Kit	1
42	053-0939-00	Wire Tie Clip	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 1/01

Printed in U.S.A.

Plumbing & Sensor Components



MA511304

Used on units with Serial Number TFN-1260 thru TFN-2024

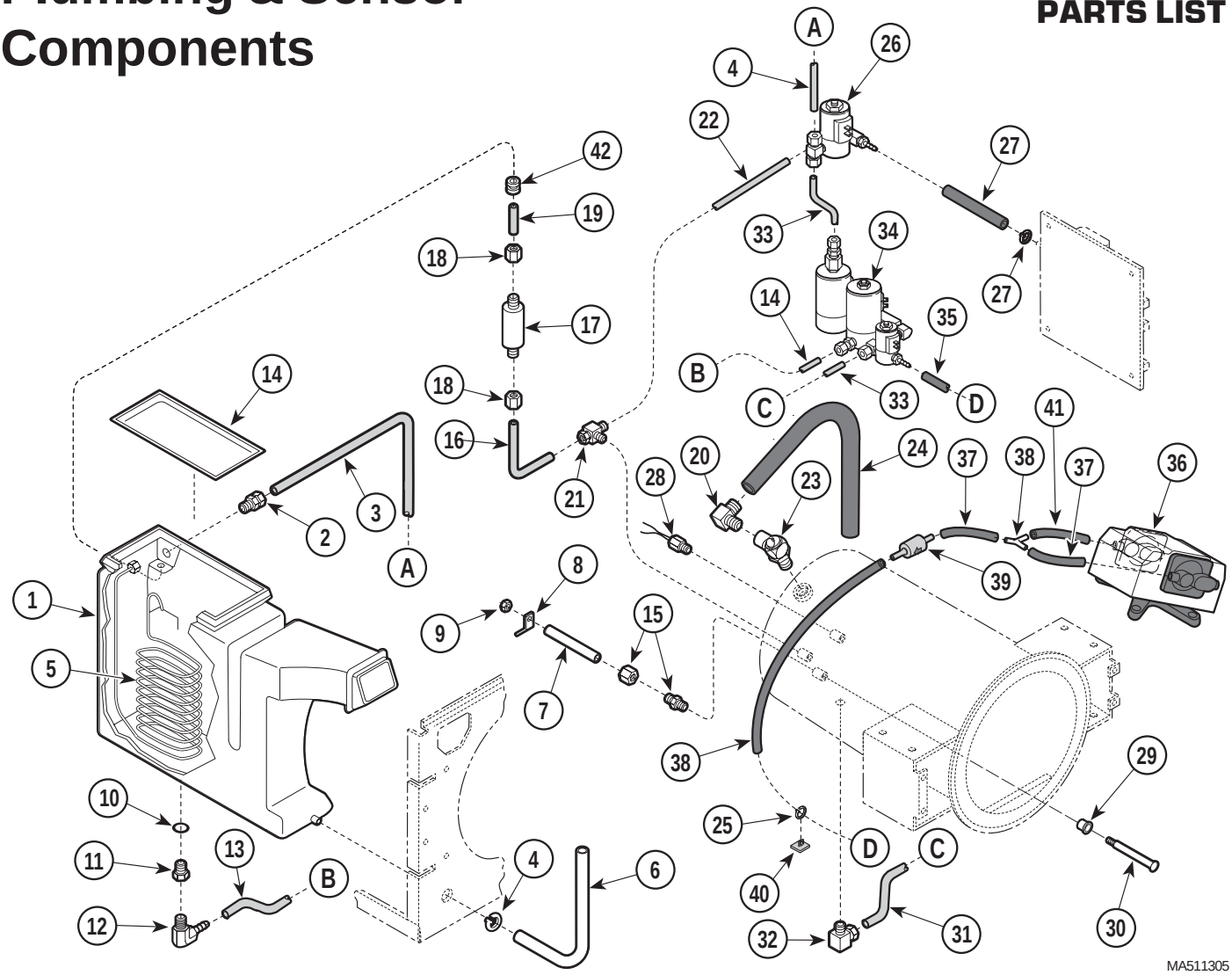
Item	Part No.	Description	Qty.
1	053-0966-00	Condensing Tank	1
2	014-0216-00	Bulkhead Union	1
3	014-0297-00	Tube	1
4	016-0748-01	Hose Clip	1
5	052-0173-00	Condensing Coil	1
6	053-0391-01	Hose	1
7	002-0358-00	Lever Sensor Tube (Includes Item 8,9,15,29, and 30)	1
8	015-0595-00	Terminal	1
9	041-0006-02	Locknut	1
10	053-0393-00	O-ring	1
11	014-0209-00	Bulkhead Couple	1
12	014-0348-00	Barb Fitting Elbow	1
13	014-1033-01	Norprene Tube	1
14	053-0966-01	Condensing Tank Lid	1
15	014-0212-00	Connector	1
16	014-0206-00	Tube	1
17	002-0375-00	Bellows Assembly	1
18	014-0392-00	Compression Nut	2
19	014-0208-00	Tube (Apply Valve Lube #064-0002-00)	1
20	014-0258-00	Male Elbow	1
21	014-0202-00	Male Branch Tee	12
22	014-0295-00	Dry Solenoid Tube	1
23	002-0359-01	Pressure Relief Valve (40 P.S.I.) (Includes Elbow, Item 22)	1
24	053-0613-02	Tube - Pressure Relief	1
25	015-0013-05	Cable Tie	2
26		Solenoid Assembly (Refer to "Dry Solenoid Manifold Assembly" Elsewhere)	Ref
27	053-0404-03	Pressure Sensor Tube	1
28	002-0357-00	Temperature Probe Assembly	1
29	053-0407-00	Spacer	1
30	030-0858-00	Level Sensor Assembly	1
31	014-0303-00	Tube	1
32	014-0184-01	Male 90° Elbow	1
33	014-0296-00	Fill / Drying Tube	1
34		Manifold Assembly (Refer to "Manifold Assembly" Elsewhere)	Ref
35	053-0891-04	Dry Solenoid Tube	1
36	029-2167-00	Air Compressor Assembly	1
37	053-0891-03	Compressor Tube	2
38	014-0299-00	"Y" Fitting	1
39	002-0594-00	Hepa Filter Kit	1
40	053-0939-00	Wire Tie Clip	1
41	053-0891-05	Compressor Tube	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 1/01

Printed in U.S.A.

Plumbing & Sensor Components



MA511305

Used on units with Serial Number TFN-2025 thru Present

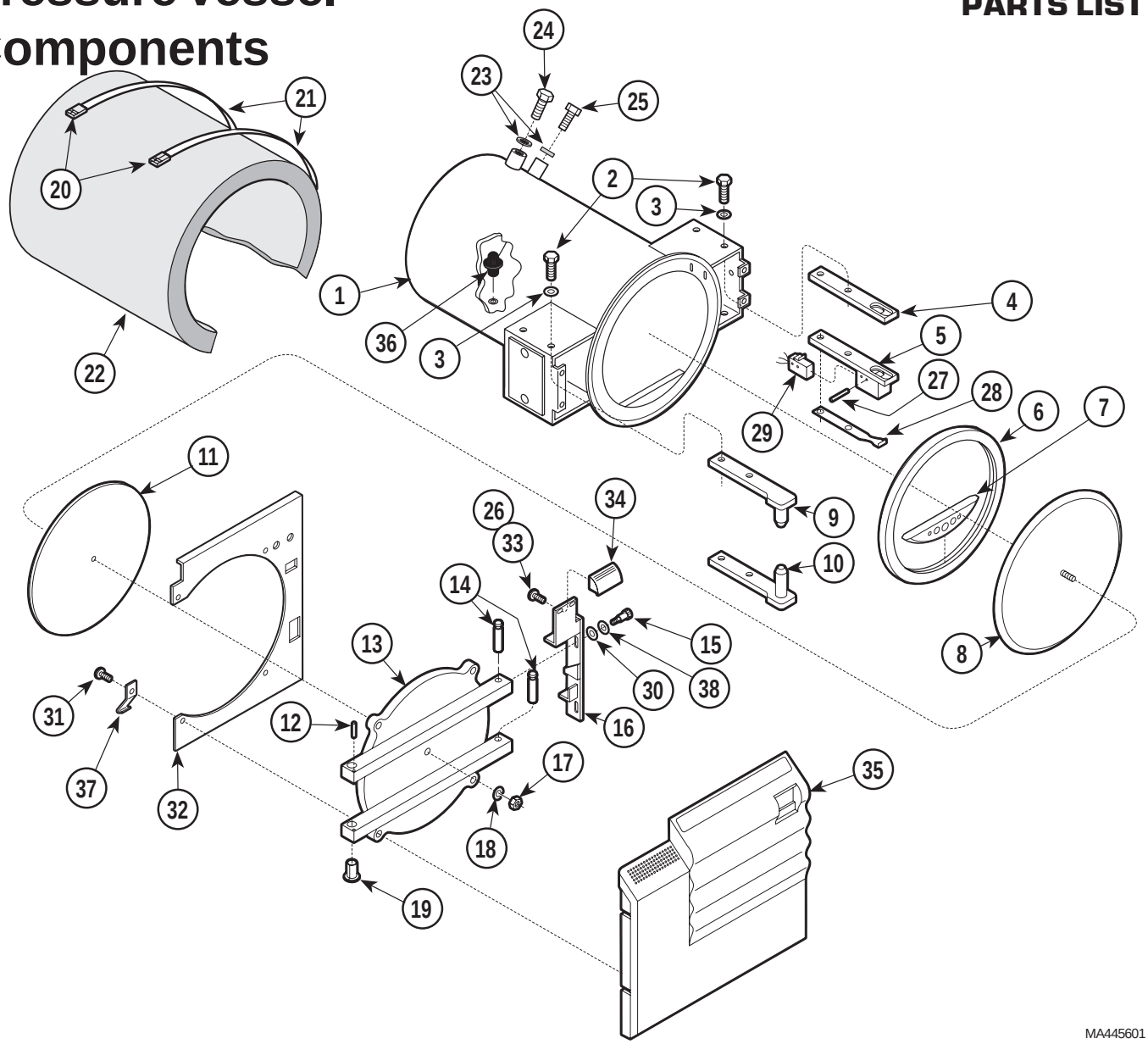
Item	Part No.	Description	Qty.
1	053-0966-00	Condensing Tank	1
2	014-0216-00	Bulkhead Union	1
3	014-0297-00	Tube	1
4	016-0748-01	Hose Clip	1
5	052-0173-00	Condensing Coil	1
6	053-0391-01	Hose	1
7	002-0358-00	Lever Sensor Tube (Includes Item 8,9,15,29, and 30)	1
8	015-0595-00	Terminal	1
9	041-0006-02	Locknut	1
10	053-0393-00	O-ring	1
11	014-0209-00	Bulkhead Couple	1
12	014-0348-00	Barb Fitting Elbow	1
13	014-1033-01	Norprene Tube	1
14	053-0966-01	Condensing Tank Lid	1
15	014-0212-00	Connector	1
16	014-0206-00	Tube	1
17	002-0654-00	Bellows Assembly	1
18	014-0392-00	Compression Nut	2
19	014-0208-00	Tube (Apply Valve Lube #064-0002-00)	1
20	014-0258-00	Male Elbow	1
21	014-0202-00	Male Branch Tee	12
22	014-0295-00	Dry Solenoid Tube	1
23	002-0359-01	Pressure Relief Valve (40 P.S.I.) (Includes Elbow, Item 22)	1
24	053-0613-02	Tube - Pressure Relief	1
25	015-0013-05	Cable Tie	2
26		Solenoid Assembly (Refer to "Dry Solenoid Manifold Assembly" Elsewhere)	Ref
27	053-0404-03	Pressure Sensor Tube	1
28	002-0357-00	Temperature Probe Assembly	1
29	053-0407-00	Spacer	1
30	030-0858-00	Level Sensor Assembly	1
31	014-0303-00	Tube	1
32	014-0184-01	Male 90° Elbow	1
33	014-0296-00	Fill / Drying Tube	1
34		Manifold Assembly (Refer to "Manifold Assembly" Elsewhere)	Ref
35	053-0891-04	Dry Solenoid Tube	1
36	029-2167-00	Air Compressor Assembly	1
37	053-0891-03	Compressor Tube	2
38	014-0299-00	"Y" Fitting	1
39	002-0594-00	Hepa Filter Kit	1
40	053-0939-00	Wire Tie Clip	1
41	053-0891-05	Compressor Tube	1
42	053-0394-02	Grommet	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 4/01

Printed in U.S.A.

Pressure Vessel Components



MA445601

Used on units with Serial Number TFN-1000 thru TFN-1462

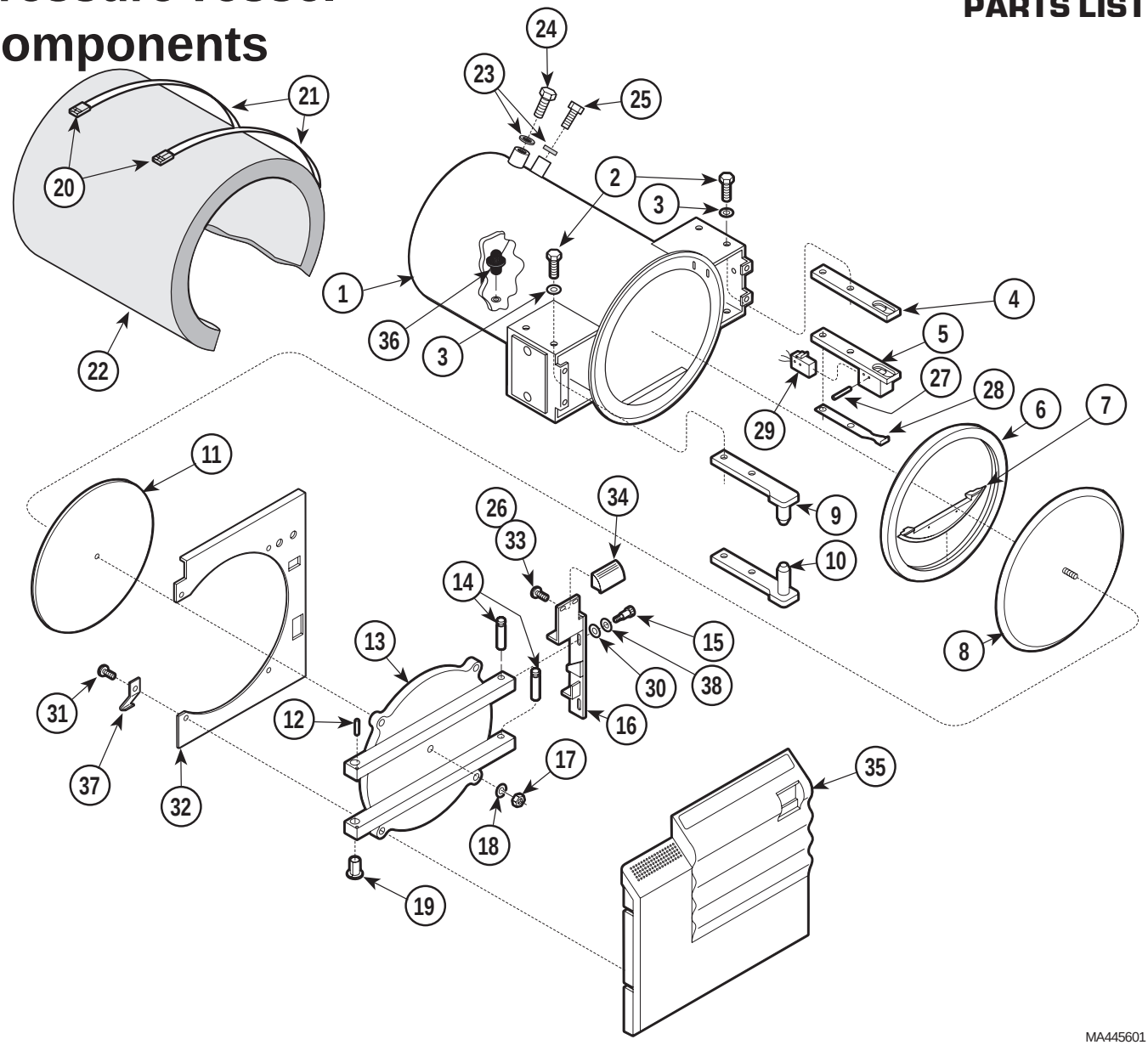
Item	Part No.	Description	Qty.
1		Chamber	1
2		Screw	8
3		Washer	8
4		Right Bracket	1
5		Switch Weldment	1
6	053-0366-00	Door Gasket (Incl. in 002-0361-00 Kit)	1
7	053-0508-00	Dam Gasket (Incl. in 002-0361-00 Kit)	1
8	030-1016-00	Housing	1
9		Top Bracket	1
10		Bottom Bracket	1
11	016-0395-01	Door Insulation Pad	1
12	042-0104-00	Roll Pin	1
13		Door	1
14		Door Bolt	2
15		Shoulder Screw	2
16		Latch	1
17	041-0000-00	Nut	1
18	045-0000-00	Lockwasher	1
19		Flange Bearing	2
20	H99387	Aluminum Seal	2
21	H99388-36	Insulation Strap	2
22	053-0385-01	Insulation Wrapper	1
23	014-0291-00	Test Port Washer	2
24	014-0290-00	Pressure Test Port Screw	1
25	014-0290-01	Temperature Test Port Screw	1
26	064-0014-00	Grease	AR
27	042-0001-23	Roll Pin	2
28	050-2362-00	Spring Arm	1
29	002-0362-00	Door Switch (Includes Item 27)	1
30		Washer	2
31	040-0008-50	Screw	4
32	050-4001-00	Inside Door Cover	1
33	040-0010-75	Screw	2
34	053-0912-00	Door Handle	1
35	053-0911-08	Midmark M9A Door Panel (Incl. Decals)	1
36	002-0360-00	Filter	1
37	050-2347-00	Door Spring	1
38		Washer	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 1/01

Printed in U.S.A.

Pressure Vessel Components



MA445601

Used on units with Serial Number TFN-1463 thru Present

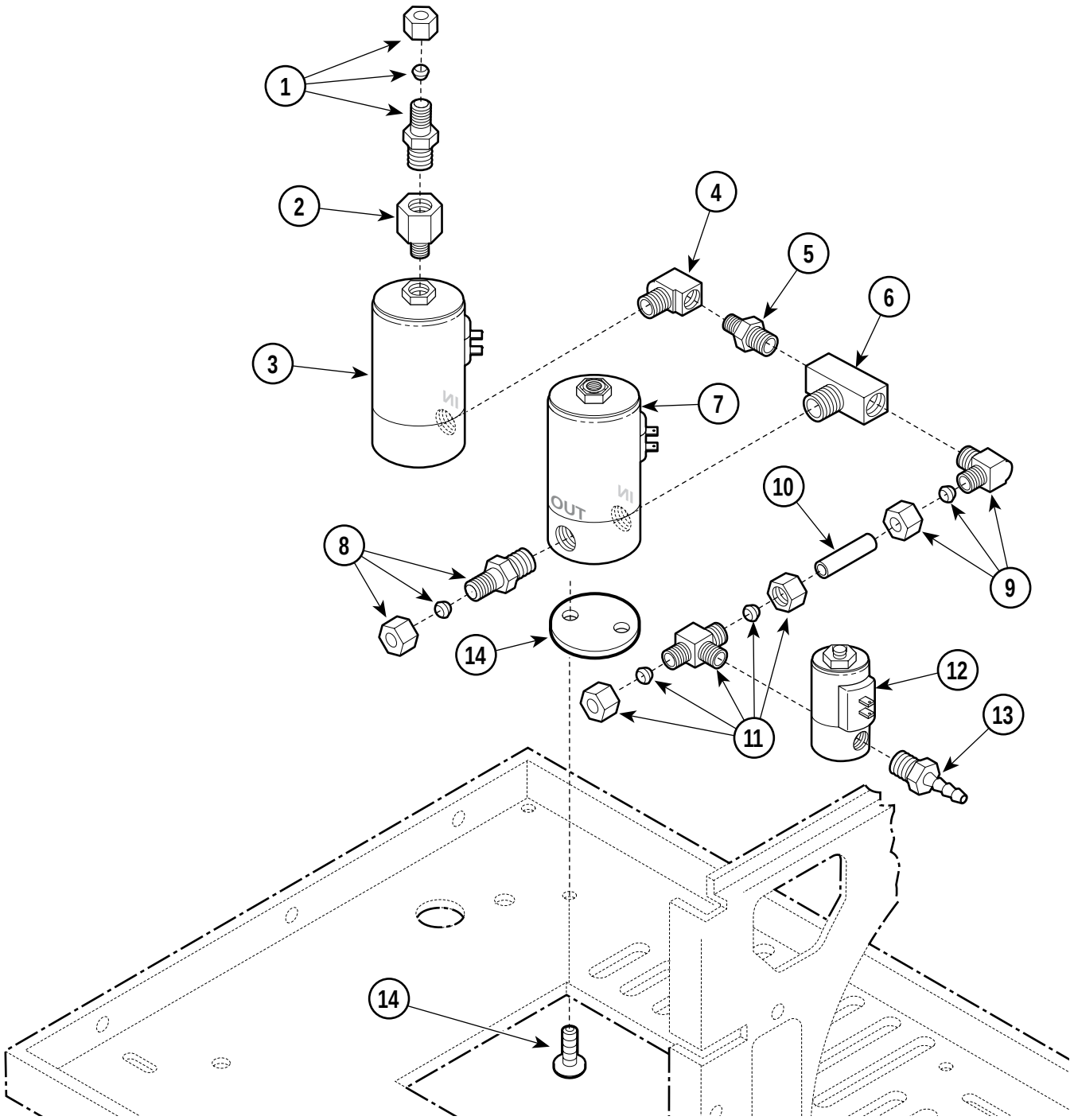
Item	Part No.	Description	Qty.
1		Chamber	1
2		Screw	8
3		Washer	8
4		Right Bracket	1
5		Switch Weldment	1
6	053-0366-00	Door Gasket (Incl. in 002-0361-01 Kit)	1
7	053-0903-00	Dam Gasket (Incl. in 002-0361-01 Kit)	1
8	030-1016-00	Housing	1
9		Top Bracket	1
10		Bottom Bracket	1
11	016-0395-01	Door Insulation Pad	1
12	042-0104-00	Roll Pin	1
13		Door	1
14		Door Bolt	2
15		Shoulder Screw	2
16		Latch	1
17	041-0000-00	Nut	1
18	045-0000-00	Lockwasher	1
19		Flange Bearing	2
20	H99387	Aluminum Seal	2
21	H99388-36	Insulation Strap	2
22	053-0385-01	Insulation Wrapper	1
23	014-0291-00	Test Port Washer	2
24	014-0290-00	Pressure Test Port Screw	1
25	014-0290-01	Temperature Test Port Screw	1
26	064-0014-00	Grease	AR
27	042-0001-23	Roll Pin	2
28	050-2362-00	Spring Arm	1
29	002-0362-00	Door Switch (Includes Item 27)	1
30		Washer	2
31	040-0008-50	Screw	4
32	050-4001-00	Inside Door Cover	1
33	040-0010-75	Screw	2
34	053-0912-00	Door Handle	1
35	053-0911-08	Midmark M9A Door Panel (Incl. Decals)	1
36	002-0360-00	Filter	1
37	050-2347-00	Door Spring	1
38		Washer	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 1/01

Printed in U.S.A.

Manifold Assembly



MA445500

Used on units with Serial Number TFN-1000 thru TFN-1005

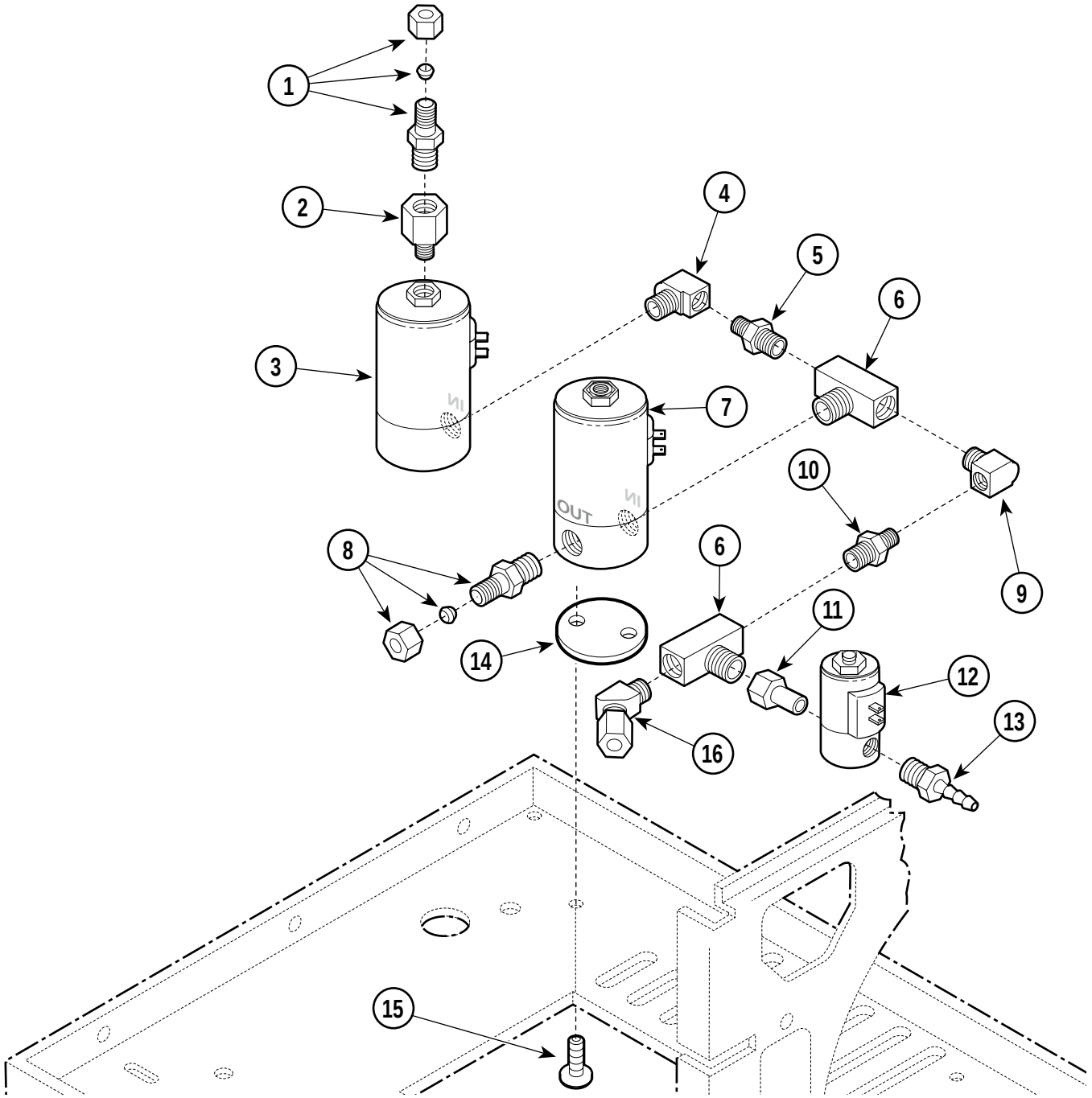
Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	014-0183-01	Male Connector	1	8	014-0183-02	Male Connector	1
2		Reducer Fitting	1	9	014-0184-01	Male 90° Elbow	1
3	014-0275-01	Solenoid Valve {240V/50Hz} (Includes Item 2)	1	10	014-0302-00	Fill Soleniod Tube	1
4	014-0194-00	Street Elbow	1	11	014-0202-01	Male Branch Tee	1
5	014-0276-00	Reducer Nipple	1	12	014-0283-00	Solenoid Valve {240V/50Hz}	1
6	014-0234-00	Male Branch Tee	1	13	014-0282-04	Male Barb Fitting	1
7	014-0236-03	Solenoid Valve {240V/50Hz}	1	14	050-2657-00	Spacer	1
				15	040-0010-74	Screw (Apply Loctite #042-0024-00)	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 3/00

Printed in U.S.A.

Manifold Assembly



MA484800

Used on units with Serial Number TFN-1006 thru TFN-1259

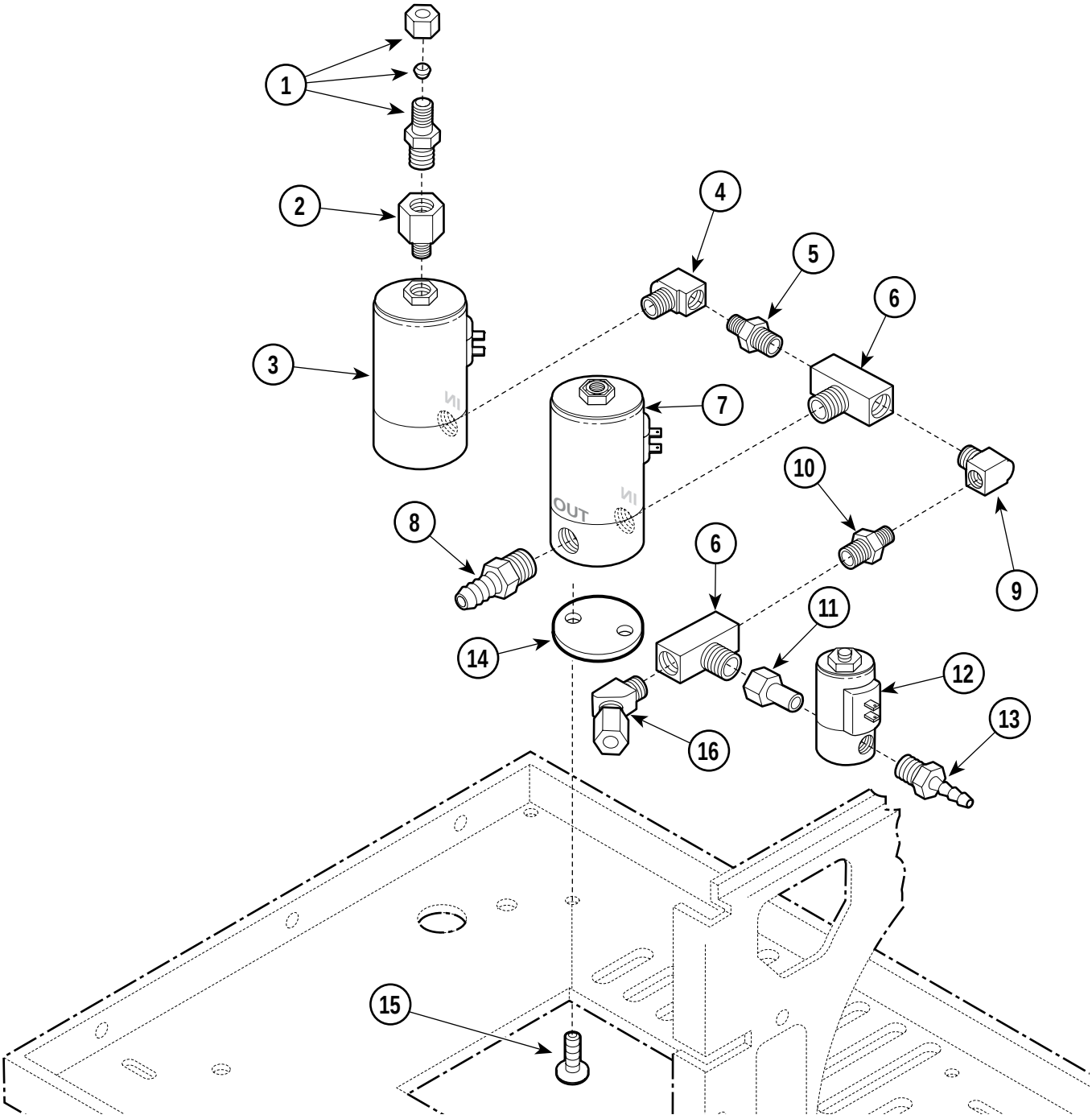
Item	Part No.	Description	Qty.
1	014-0183-01	Male Connector	1
2		Reducer Fitting	1
3	014-0275-01	Solenoid Valve {240V/50Hz} (Includes Item 2)	1
4	014-0194-00	Street Elbow	1
5	014-0276-00	Reducer Nipple	1
6	014-0234-00	Male Branch Tee	2
7	014-0236-03	Solenoid Valve {240V/50Hz}	1
8	014-0183-02	Male Connector	1
9	014-0194-01	90° Street Elbow	1
10	014-0045-02	Nipple	1
11	014-0317-00	1/8" x 1/4" Male Adapter	1
12	014-0283-00	Solenoid Valve {240V/50Hz}	1
13	014-0282-04	Male Barb Fitting	1
14	050-2657-00	Spacer	1
15	040-0010-74	Screw (Apply Loctite #042-0024-00)	2
16	014-0201-00	Male 45° Elbow	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 3/00

Printed in U.S.A.

Manifold Assembly



MA511200

Used on units with Serial Number TFN-1260 thru Present

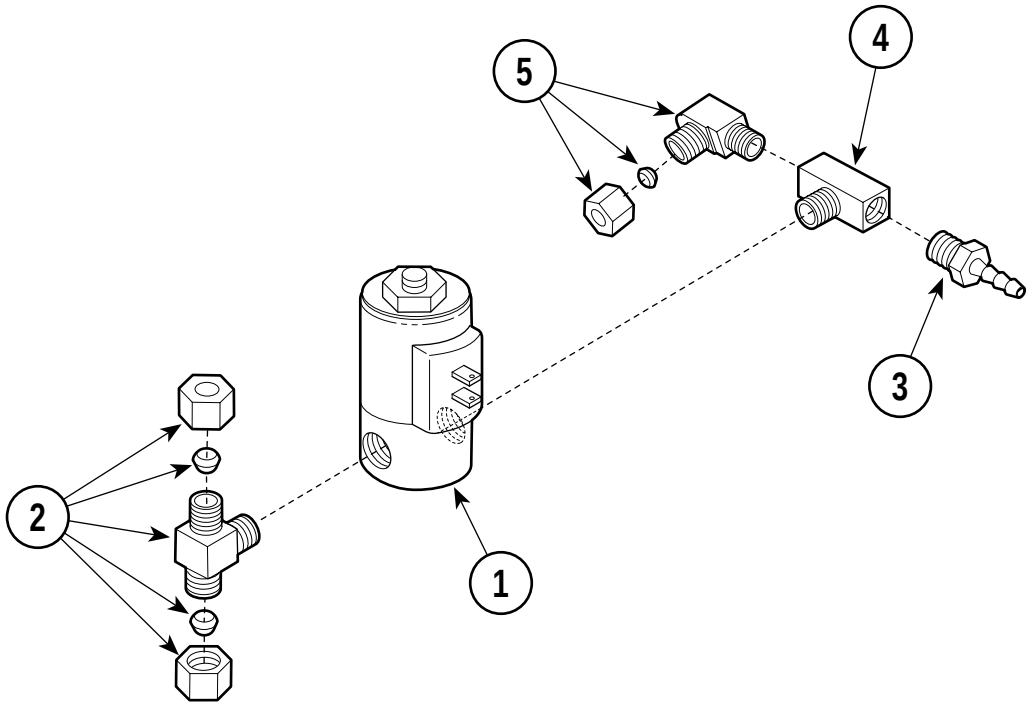
Item	Part No.	Description	Qty.
1	014-0183-01	Male Connector	1
2		Reducer Fitting	1
3	014-0275-01	Solenoid Valve {240V/50Hz} (Includes Item 2)	1
4	014-0194-00	Street Elbow	1
5	014-0276-00	Reducer Nipple	1
6	014-0234-00	Male Branch Tee	2
7	014-0236-03	Solenoid Valve {240V/50Hz}	1
8	014-0347-00	Barb Fitting Connector	1
9	014-0194-01	90° Street Elbow	1
10	014-0045-02	Nipple	1
11	014-0317-00	1/8" x 1/4" Male Adapter	1
12	014-0283-00	Solenoid Valve {240V/50Hz}	1
13	014-0282-04	Male Barb Fitting	1
14	050-2657-00	Spacer (Used with Flat Bottom Base)	1
15	040-0010-74	Screw (Apply Loctite #042-0024-00)	2
16	014-0201-00	Male 45° Elbow	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev 3/00

Printed in U.S.A.

Dry Solenoid Manifold Assembly



MA445800

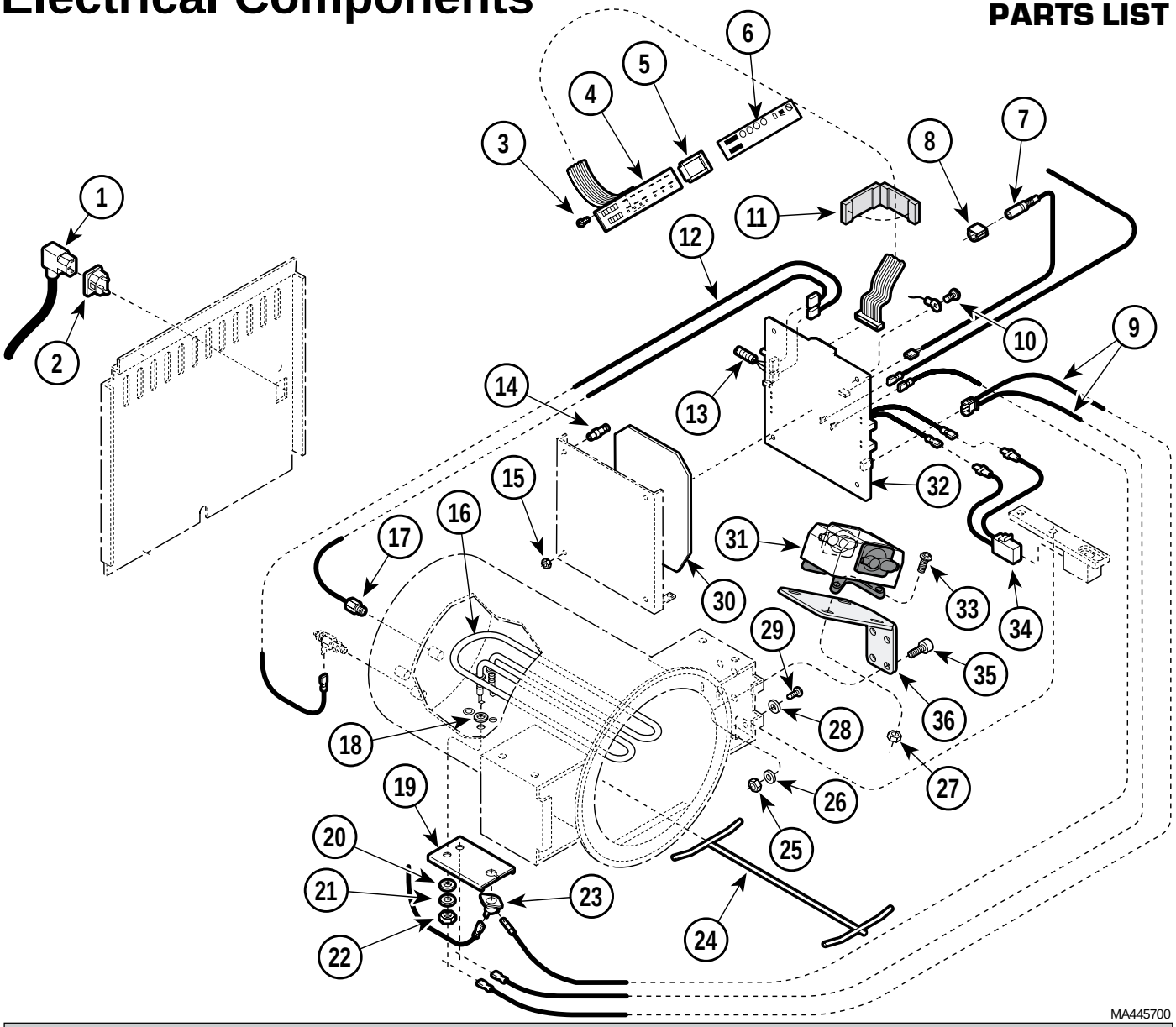
Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	014-0283-00	N.C. Solenoid Valve {240V/50Hz}	1	4	014-0110-00	Male Branch Tee	1
2	014-0202-00	Male Branch Tee	1	5	014-0184-00	Male Elbow	1
3	014-0282-02	Male Barb Fitting	1				

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Electrical Components



MA445700

Used on units with Serial Number TFN-1260 thru TFN-1463,1465,1466, 1467

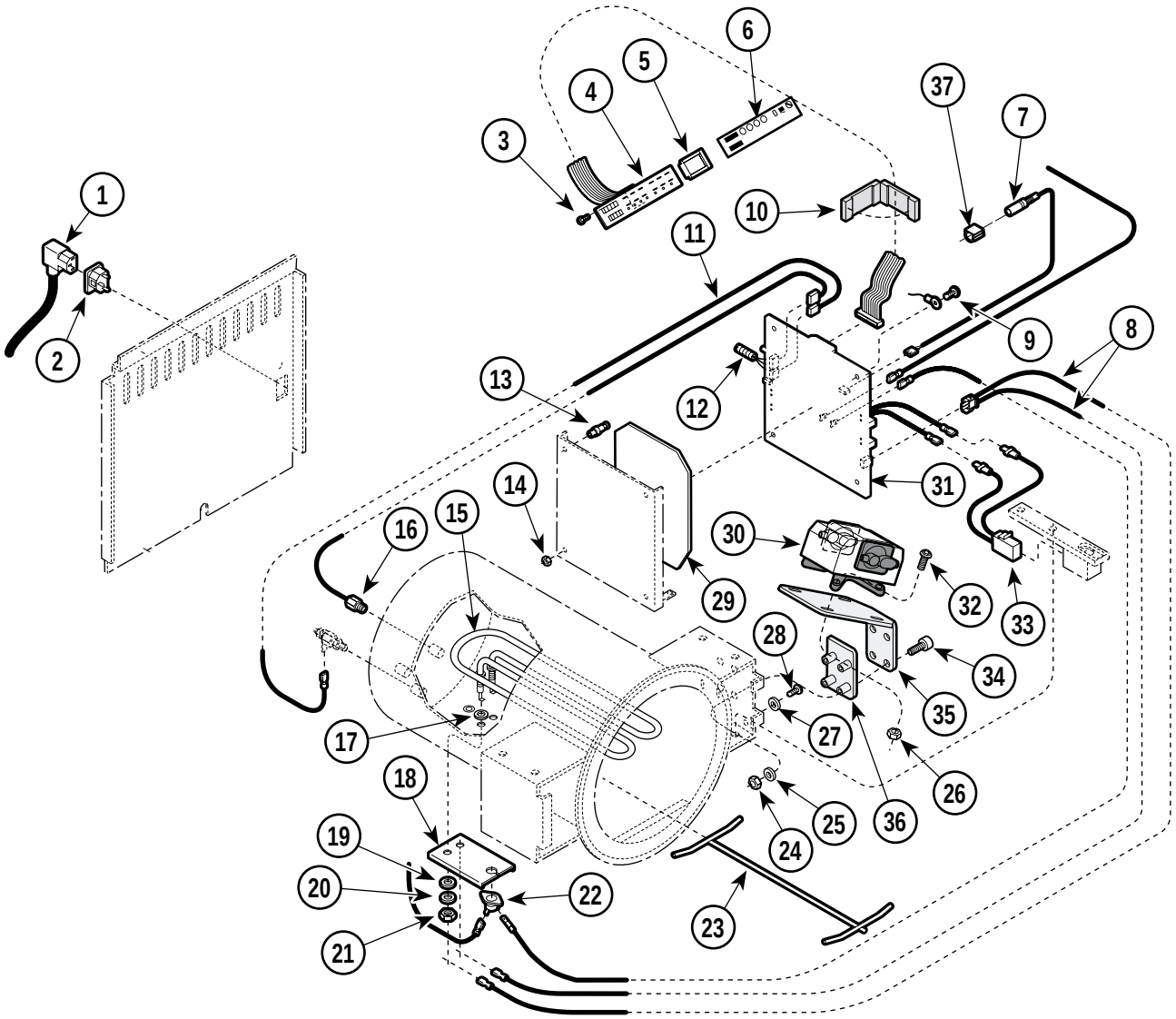
Item	Part No.	Description	Qty.
1	015-0363-04	Australian Cord Set	1
2	015-0639-00	AC Connector Receptacle	1
3	040-0006-04	Screw (Apply Loctite #042-0024-00)	6
4	002-0369-03	Display PC Board	1
5	053-0454-00	Display Gasket	1
6	061-0272-00	Display Overlay	1
7		PCB/Printer Harness (Refer to "Printer Components" Elsewhere)	Ref
8	053-0389-01	Printer Harness Clip	1
9	015-0657-00	PCB/Heater Harness	1
10	040-0010-46	Screw (Apply Loctite #042-0024-00)	1
11	015-1096-00	Flat Cable EMI Suppression	1
12	015-0654-00	Chamber Level Sensor Harness	1
13	015-0257-02	Flex Guard Tubing	1
14	053-0295-01	Standoff	3
15	041-0010-04	Locknut	1
16	002-0367-01	Heat Element (Includes Nut)	1
17	002-0357-00	Temperature Probe Assembly	1
18	H98137	Gasket	2
19	050-3503-00	Bracket	1
20	H97971	Washer	2
21	045-0001-56	Lockwasher	2
22	H97949	Nut	2
23	002-0370-00	Thermostat	1
24	057-0425-00	Spacer Assembly	1
25	041-0010-08	Nut	4
26	045-0001-87	Washer	4
27	041-0008-02	Nut	4
28	045-0001-31	Washer	1
29	040-0010-95	Screw	1
30	053-0792-00	Insulator	1
31		Air Compressor (Refer to "Plumbing & Sensor Components" Elsewhere)	Ref
32		Control PC Board (Refer to "Control PC Board" Elsewhere)	Ref
33	040-0008-80	Screw	4
34	002-0362-00	Switch Assembly	1
35	040-0010-108	Screw	4
36	050-3999-00	Compressor Mounting Bracket	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 5/99

Printed in U.S.A.

Electrical Components



MA445702

Used on units with Serial Number TFN-1464 and TFN-1468 thru Present

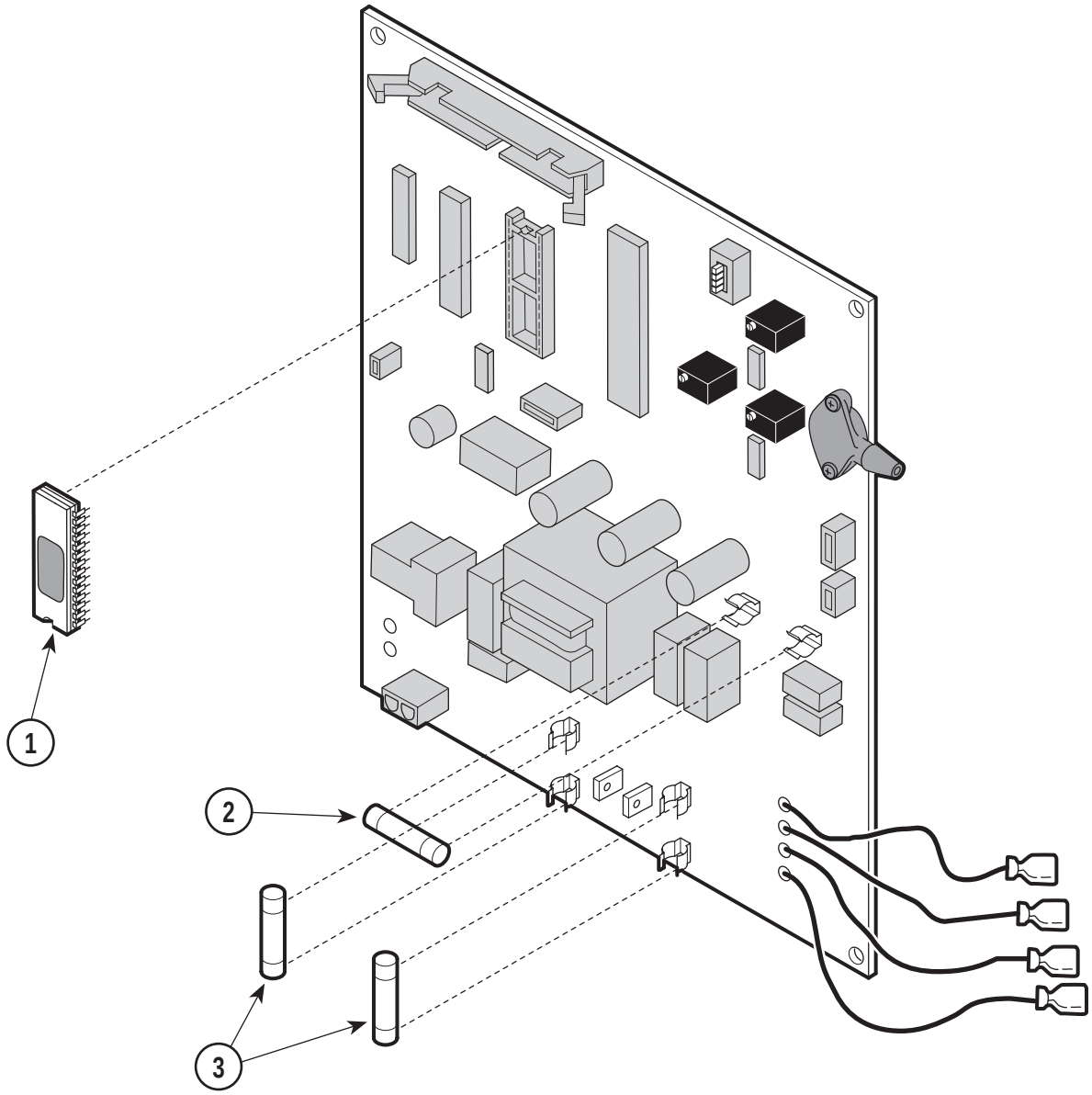
Item	Part No.	Description	Qty.
1	015-0363-04	Australian Cord Set	1
2	015-0639-00	AC Connector Receptacle	1
3	040-0006-04	Screw (Apply Loctite #042-0024-00)	6
4	002-0369-03	Display PC Board	1
5	053-0454-00	Display Gasket	1
6	061-0272-00	Display Overlay	1
7		PCB/Printer Harness (Refer to "Printer Components" Elsewhere)	Ref
8	015-0657-00	PCB/Heater Harness	1
9	040-0010-46	Screw (Apply Loctite #042-0024-00)	1
10	015-1096-00	Flat Cable EMI Suppression	1
11	015-0654-00	Chamber Level Sensor Harness	1
12	015-1395-00	Flex Guard Tubing	1
13	053-0295-01	Standoff	3
14	041-0010-04	Locknut	1
15	002-0367-01	Heat Element (Includes Nut)	1
16	002-0357-00	Temperature Probe Assembly	1
17	H98137	Gasket	2
18	050-3503-00	Bracket	1
19	H97971	Washer	2
20	045-0001-56	Lockwasher	2
21	H97949	Nut	2
22	002-0370-00	Thermostat	1
23	057-0425-00	Spacer Assembly	1
24	041-0010-08	Nut	4
25	045-0001-87	Washer	4
26	041-0008-02	Nut	4
27	045-0001-31	Washer	1
28	040-0010-95	Screw	1
29	053-0792-00	Insulator	1
30		Air Compressor (Refer to "Plumbing & Sensor Components" Elsewhere)	Ref
31		Control PC Board (Refer to "Control PC Board" Elsewhere)	Ref
32	040-0008-80	Screw	4
33	002-0362-00	Switch Assembly	1
34	040-0010-108	Screw	4
35	050-4585-10	Compressor Mounting Bracket	1
36	030-1224-00	Mounting Bracket	1
37	053-0389-01	Printer Harness Clip	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 3/00

Printed in U.S.A.

Control PC Board



MA445200

Used on units with Serial Number TFN-1000 to TFN-1019

Item	Part No.	Description	Qty.
	015-1048-11	Control PC Board (Includes Item 1thru 3)	1

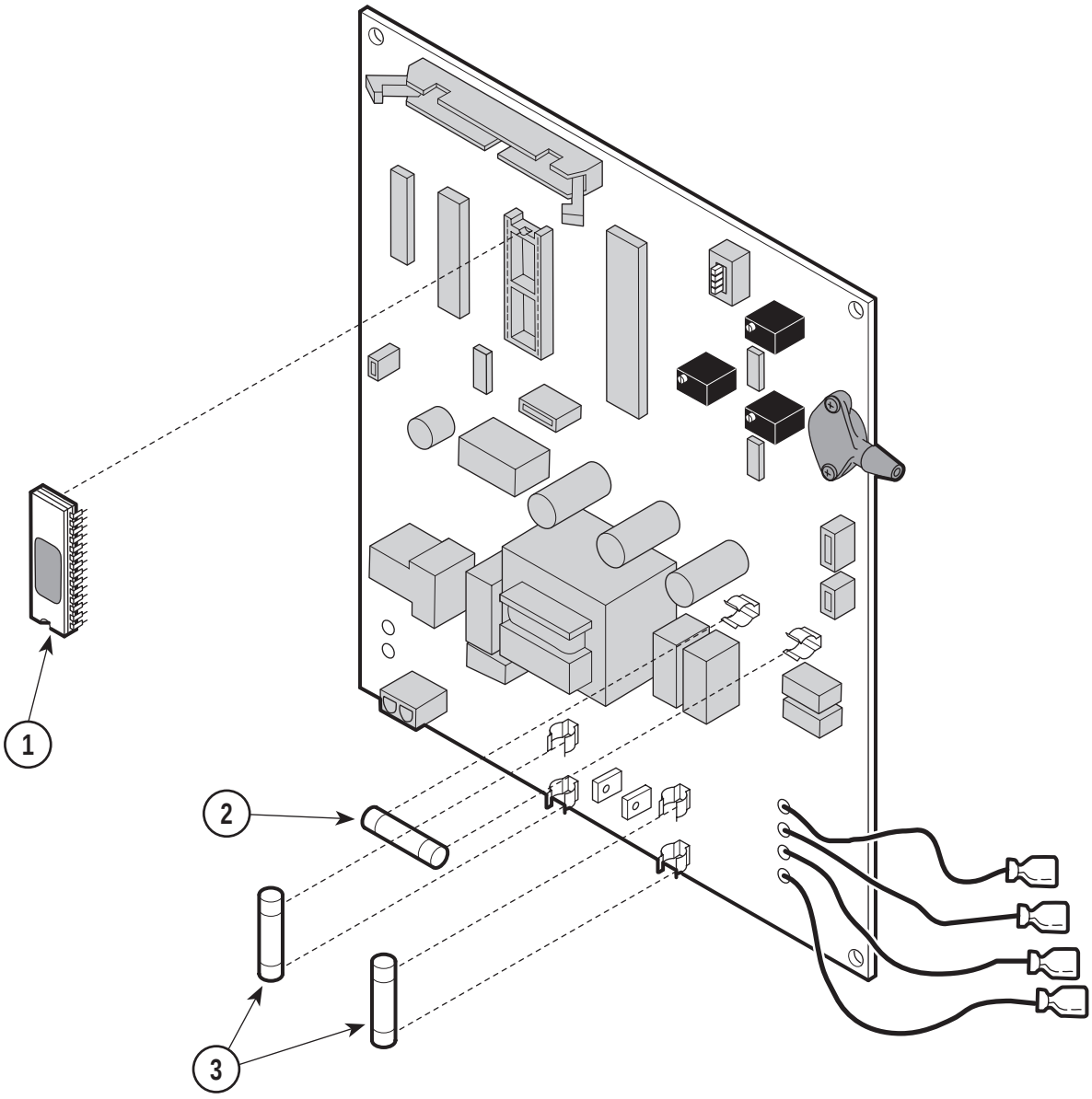
Item	Part No.	Description	Qty.
1	•	• M9A EPROM	Ref
2	• 015-0346-08	• Printer Fuse (3 amp/250 V)	1
3	• 015-0346-11	• Line Fuse (8 amp/250 V)	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 9/98

Printed in U.S.A.

Control PC Board



MA445200

Used on units with Serial Number TFN-1020 to Present

Item	Part No.	Description	Qty.
	015-1179-11	Control PC Board (Includes Item 1thru 3)	1

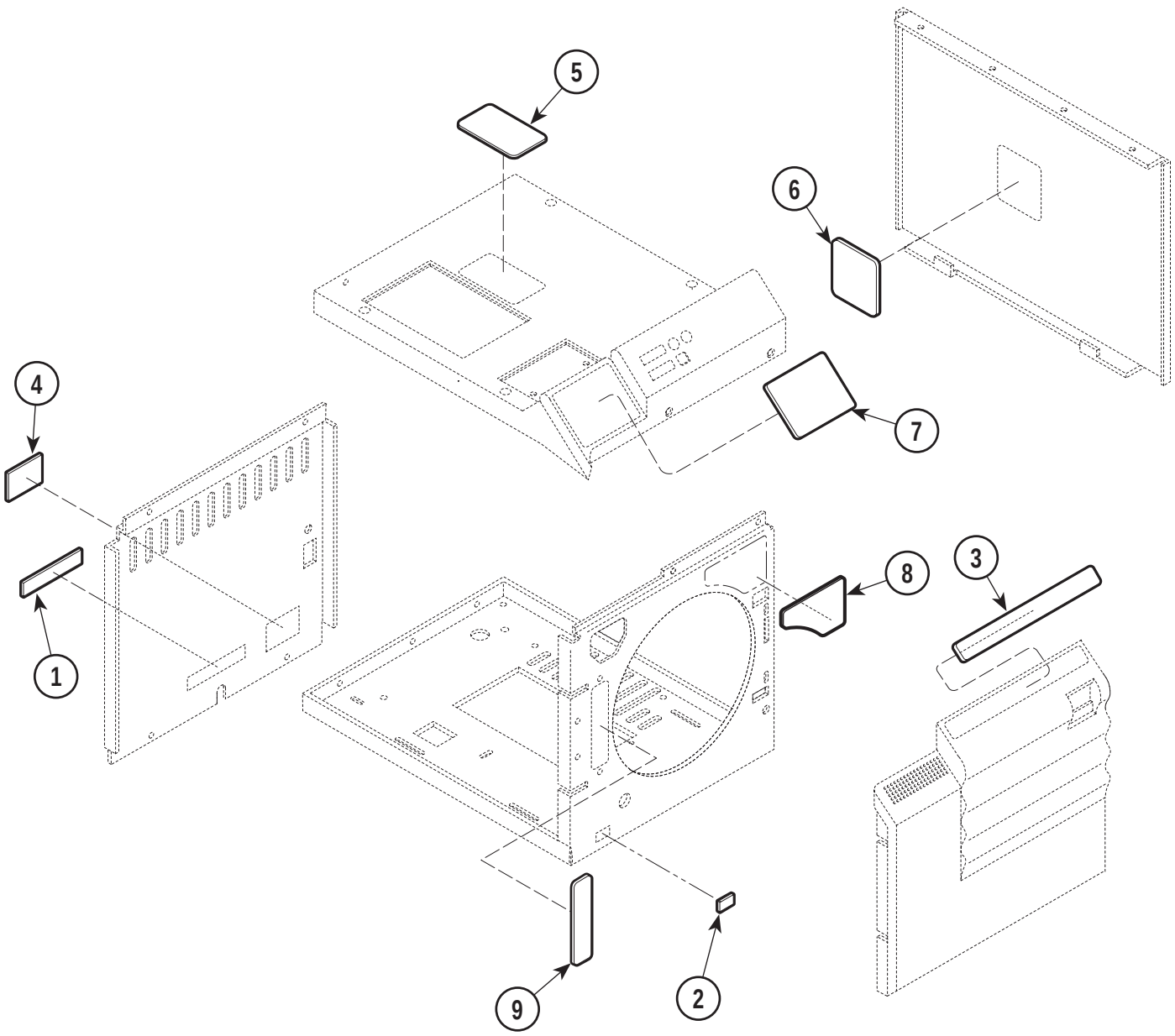
Item	Part No.	Description	Qty.
1	•	• M9A EPROM	Ref
2	• 015-0346-08	• Printer Fuse (3 amp/250 V)	1
3	• 015-0346-11	• Line Fuse (8 amp/250 V)	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 9/98

Printed in U.S.A.

Labels and Decals



MA445000

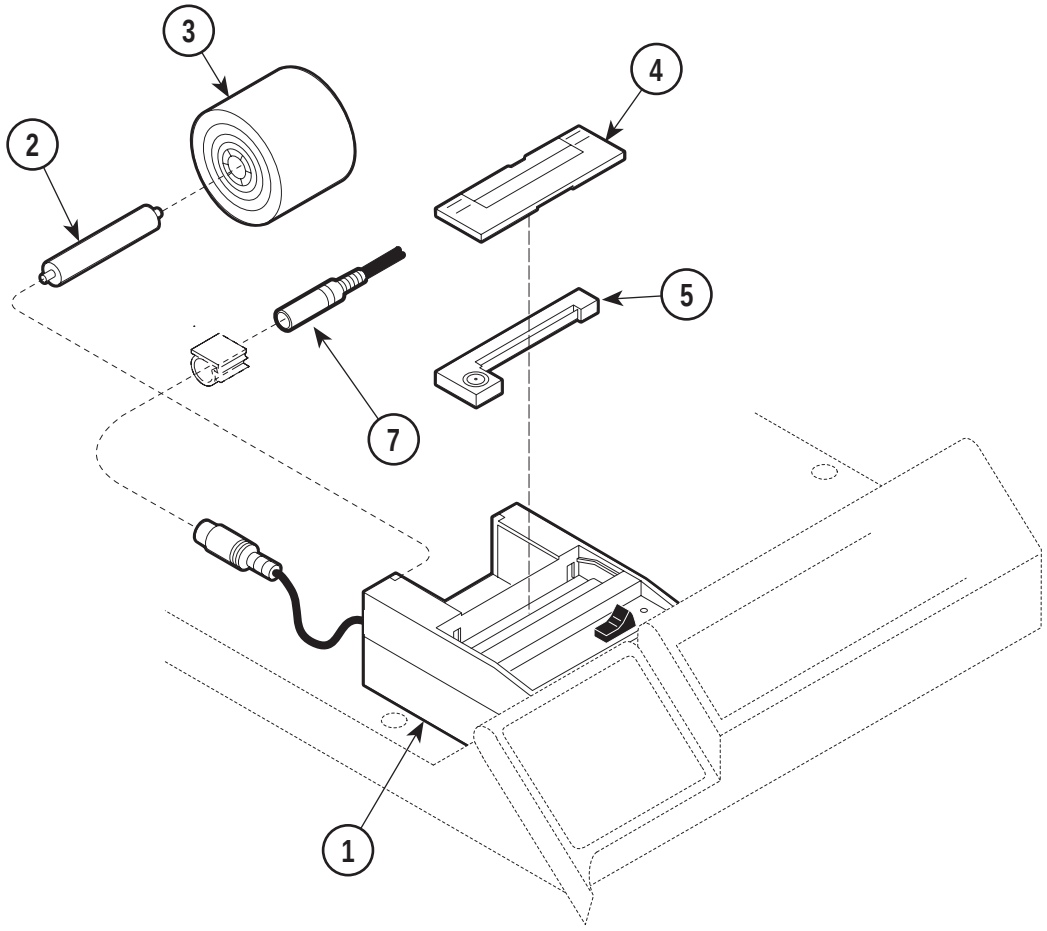
Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	061-0203-00	Label - Electrical Shock	1	7	061-0644-00	M9A Label - Warning	1
2		Label - Small M9A Serial Number	1	8	061-0591-00	Label - Caution / Hot	1
3	061-0441-00	M9A Label - Operation	1	9	061-0311-00	Label - Water Level	1
4		Label - Large M9A Serial Number	1	10	061-0678-00	Sterilizer Label Set (Not Shown [Includes Items 5, 7 & 10)	1
5	061-0309-00	Label - Warning, P.R. Valve	1				
6	061-0663-00	Wiring Diagram Label	1				

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Printer Components



MA203302

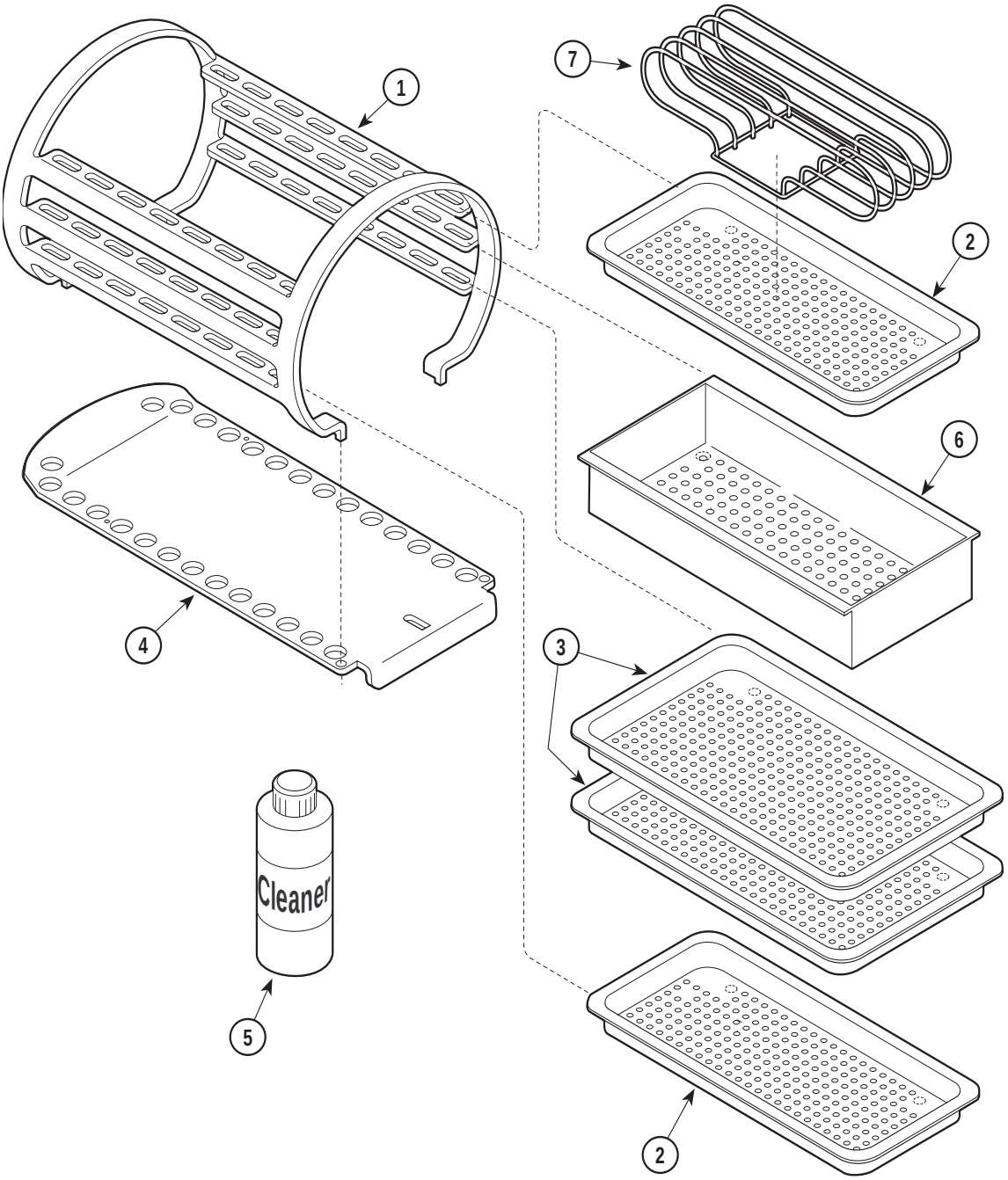
Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	9A155001	Accessory Printer (Incl. Items 2 thru 7) .	1	5	• 053-0505-00	• Printer Cartridge	1
2	• 053-0506-00	• Arbor	1	6	• 002-0371-00	• Cartridge/Paper Kit (Includes Two Rolls of Paper and One Cartridge	1
3	• 060-0008-00	• Paper Roll	1				
4	• 053-0507-00	• Cover	1	7	• 015-0978-00	• Printer Wiring Harness	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Racks, Trays, and Cleaner



MA376300

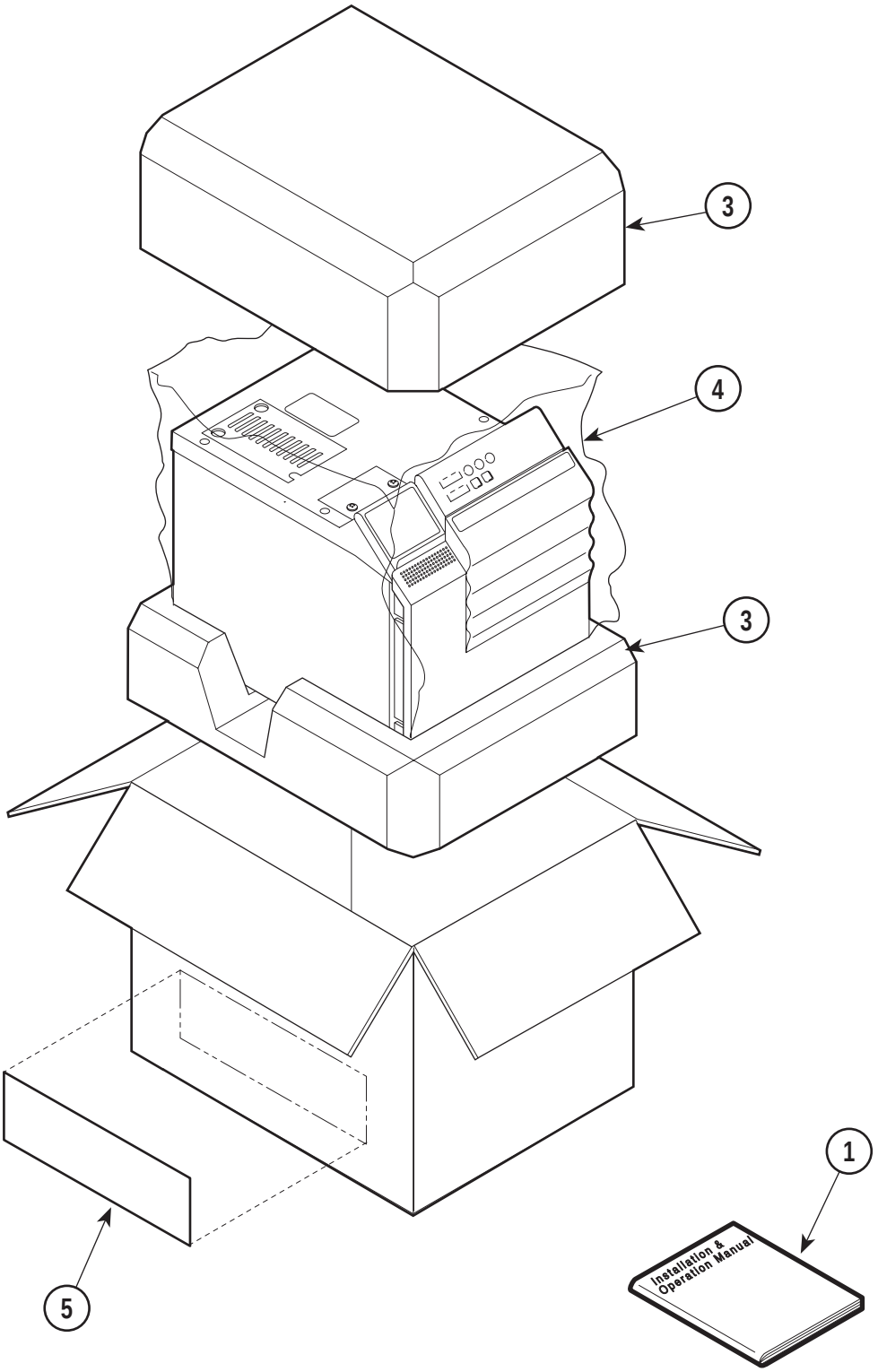
Item	Part No.	Description	Qty.
1	050-3691-00	Wire Tray Rack	1
2	002-0253-00	5" Tray	2
3	002-0374-00	7" Tray	2
4	050-3750-00	Tray Plate	1
5	002-0396-00	Sterilizer Cleaner-Midmark (Single Bottle with M.S.D.Sheet)	AR
	002-0396-01	Sterilizer Cleaner-Midmark (12 Bottle Case with M.S.D.Sheet)	AR
6	9A224001	Sterilizer Deep Tray	1
7	9A226001	Sterilizer Pouch Rack	1

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573

Printed in U.S.A.

Packaging



MA202406

Item	Part No.	Description	Qty.
1	003-0893-00	M9A Installation & Operation Manual	1
2	066-0721-00	Slotted Carton	1
3	054-0311-00	Top and Bottom Pad	1
4	053-0061-01	Poly Bag	1
5	061-0719-00	Label, Midmark	2
	061-0719-01	Label, Ritter	2

Always Specify Model & Serial Number

© Midmark Corporation 1998 SF-1573 Rev. 1/02

Printed in U.S.A.

Return To Table Of Contents

COMMENTS

The Technical Publications Department of Midmark Corporation takes pride in its publications. We are sure that our manuals will fill all of your needs when you are performing scheduled maintenance, servicing, or repairs on a Midmark product.

However, if you find any errors or feel that there should be a change, addition, or deletion to a manual, please let us know!

Page(s) and Paragraph(s) Needing Changed:

Description of Error or Desired Change:

Please fax or mail a copy of this completed comment sheet to:

Midmark Corporation
ATTN: Technical Publications Department
60 Vista Drive
Versailles, Ohio 45380
Fax: (937) 526-5542

© Midmark Corporation 1999 SF-1596

Printed in U.S.A.

Return To Table Of Contents

FAX ORDERING FORM

(SERVICE PARTS ONLY)

NOTES:

- **ALL BLOCKED AREAS MUST BE COMPLETED.**
- **USE FOR NON-WARRANTY FAX ORDERS ONLY. WARRANTY ORDERS MUST BE TELEPHONED IN (1-800-MIDMARK).**
- **ORDER MUST MEET $35.00 MINIMUM.**

SHADED AREAS TO BE FILLED OUT BY MIDMARK PERSONNEL ONLY.

REP #: _____ **DISCOUNT %:** _____ **DATE:** _____

CAT #: _____ **TECHNICIAN:** _____ **TIME:** _____

ATTENTION: SERVICE DEPARTMENT FAX#: 877-249-1793

ACCT #: _____ **P.O. #:** _____ **DATE:** _____

NAME: _____ **SHIP TO:** _____

ADDRESS: _____

CITY, ST.: _____

CONTACT: _____

PHONE: _____

☐ **NON-EMERGENCY ORDER - TO SHIP WITHIN 72 HOURS IF PART(S) IN STOCK.**

☐ **EMERGENCY ORDER - TO SHIP WITHIN 24 HOURS IF PART(S) IN STOCK (IF ORDER IS RECEIVED BEFORE 1:30 P.M. E.S.T).**

SEND NOTIFICATION IF PARTS ARE NOT AVAILABLE TO SHIP WITHIN 24 HOURS VIA E-MAIL OR FAX TO: _____

METHOD OF SHIPMENT **OTHER** _____

UPS	FED EX
☐ NEXT DAY A.M.	☐ NEXT DAY A.M.
☐ NEXT DAY P.M.	☐ NEXT DAY P.M.
☐ 2ND DAY	☐ 2ND DAY
☐ GROUND	☐ ECONOMY

FA ___
ADD ___

QTY.	PART #	DESCRIPTION (SPECIFY COLOR OF ITEM IF APPLICABLE)	COLOR CODE	PRICE/PER
	SPECIAL CODES:		**TOTAL COST: $**	

© Midmark Corporation 2000

Printed in U.S.A.

Return To Table Of Contents

MIDMARK®

Midmark Corporation, Versailles, Ohio 45380 U.S.A.
937-526-3662 FAX 877-249-1793

Return To Table Of Contents

Subject To Change Without Notice

© Midmark Corporation Rev. 8/96

Printed in U.S.A.